JOURNAL OF THE
AMERICAN DIETETIC ASSOCIATION

VOLUME 15 May, 1939 NUMBER 5

THE IMPORTANCE OF EMOTIONAL ATTITUDES FOR GOOD DIGESTION[1]

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THE fathers of medicine regarded three structures, the lungs, the heart and the brain, as the tripod of life; if any one of these structures fails, the whole elaborate and intricate organization of the body goes to pieces. Supporting the activities of the lungs, the heart and the brain, however, as well as the great bulk of skeletal muscle, which constitutes about 40 per cent of the body weight, is the digestive system. Its basic value for life has long been recognized.

From the earliest days, when the process of digestion was regarded as a sort of cooking, down to recent times, knowledge of the service of the digestive system to the rest of the organism has been slowly acquired. We now know that the nicely interrelated processes which take place after food has been chewed and swallowed are directed toward altering the food so that it becomes soluble and therefore capable of passing through the intestinal wall. The various juices poured out by the digestive glands are able to render the food soluble, even when they act in a warm glass vessel. Thus, given warm water and the digestive ferments and the food for them to work upon, digestion can progress much as it does inside the body. Since the essential digestive changes proceed if the requisite factors are present, how are we to account for the disturbances of digestion which are so often the source of discomfort and malnutrition? For an understanding of these disturbances we must recognize that conditions may develop which can affect disadvantageously the organs of digestion, and that these conditions are of primary importance.

There are two ways in which circumstances in the body may profoundly disturb the normal processes which take place in the alimentary tract. As I have reminded you, the secretions of the various digestive glands contain the ferments which render the food soluble. The state of the body, however, may interfere with the normal quantity and quality of the secretions which these glands pour out and thereby may fundamentally lessen the possibili-

[1] Annual Address read before the Greater New York Dietetic Association, Hoosac Hall, New York Academy of Medicine, February 13, 1939.

ties of properly dissolving what we eat. Again, in order that the food may be brought to the regions where the various digestive secretions are discharged, and there thoroughly mixed with these secretions, it is necessary that the muscular walls of the digestive tract shall act in a propulsive manner. And again, the state of the body may interfere with the motions of the tract and thereby seriously upset digestion. There may be stoppage of the mixing movements of the stomach and intestines and also a failure of the onward drive of the contents of the tract into parts where food is absorbed.

The disturbances of the digestive process which I have mentioned are due to the fact that the essential glands, as well as the muscles of the digestive tract, are under control of nerves. These nerves do not belong to the voluntary system by means of which we control our relations with the outer world; they belong to the involuntary system which controls the interior of the body. Two sets of these nerves are distinguishable. One set, represented mainly by the widely-effective vagus nerves, acts in the main to exert a positive influence on the digestive process. These nerves when they are active not only cause the glands to secrete, as, for example, the glands of the stomach and the pancreas, but they also have a positive action on the muscle of the whole alimentary canal down to the large intestine. Allied with the vagi are other nerves which cause secretion of the salivary glands.

The second set of nerves has mainly an inhibitory or checking action on digestive secretions and is capable of stopping the movements of the stomach and intestines. These belong to the so-called sympathetic system. They are capable of bringing the digestive process to a complete standstill.

Given these two opposing nervous influences, which may favor the processes of digestion or seriously interfere with them, we are now in a position to understand how general bodily conditions may affect the normal course of the digestion and the absorption of food. On the one hand, the first set which I have mentioned—the stimulatory nerves which call forth secretion and promote the passage of food through the alimentary tract—may not be active. In that state digestion may suffer because of absence of the secretions and therefore absence of the ferments which are required to dissolve the ingested nutriment. Also when these nerves are inactive the muscles of the alimentary tract are indolent and consequently do not perform their functions. On the other hand, the general bodily condition may be such as to cause discharge of impulses along the nerves which check secretion from the glands and stop the gastro-intestinal movements. In those circumstances the passage of the food on its way to being made useful for the organism is sharply interrupted. I now propose to consider in detail some of the ways in which these two sets of nervous influences affect digestion.

Let us take up first the excitatory nerves—those promoting the digestive secretions, and the propulsive and churning actions carried on by the muscular coat of the alimentary tube. As I pointed out earlier, the chief nerves in this service are the vagi.

Many years ago I had occasion to note that there is total absence of mo-

tion in that part of the esophagus which is composed of the typical nonstriated muscle of the digestive tube if vagal impulses are interrupted. Then, for many hours food remained stagnant not only in the esophagus but also in the stomach itself. Only gradually did these two parts of the alimentary canal recover the ability to carry on, by themselves, the normal propulsive movements. It is noteworthy that immediately after these organs were deprived of vagal influences they relaxed; only gradually did they recover a contracted state. When that state was recovered, however, the presence of food resulted in the usual activities—a peristaltic wave in the esophagus which pushes the contents into the stomach, and repeated peristaltic waves in the stomach which churn the food and gradually press it onward. It seems, therefore, that the recovery of functional power in both the esophagus and the stomach is due to the development of a moderate state of contraction so that the muscle exerts pressure when it is stretched. Ordinarily this slight state of contraction or tone is established by vagal influences. The primary effect of excluding these influences is a loss of this state. Only when the muscle has regained its tone independently is it able again to carry on its proper activity. The evidence which I have just surveyed permits us to draw the conclusion that the vagus nerves are not motor nerves, as they are sometimes called; they are more properly designated tonic nerves. If the tonic activity of the vagi increases, the vigor of the peristaltic contractions increases. The tonic state of the smooth muscle of the digestive tract is a basic condition for activity; the various parts of the tract can carry out effectively their functions, if only that condition is present.

All that I have said thus far regarding the effect of the positively acting, stimulatory nerves on digestion is related in an important way to bodily vigor. The evidence on which that statement is based is that these nerves participate with the rest of the body in any debilitation due to illness. For example, while the vagal connections between the central nervous system and the alimentary canal are intact, the general bodily weakness which is associated with a serious infection and which is characterized by soft, toneless skeletal muscles, is characterized also by a toneless state of the muscles of the stomach and intestines. Cats weakened by infection I have observed repeatedly with the Röntgen rays, and throughout the whole day I have recorded the food stagnating in the stomach without the slightest sign of a peristaltic wave passing over it; or, if the food had entered the intestine I have noted that it was similarly unaffected by any motions of the gut. The animals manifested no indications of appetite or hunger and did not eat spontaneously. From the evidence which I have already presented regarding the importance of excitatory, tonic vagal influences on the muscles of the stomach and intestines, we may assume that the indolence or total inactivity of these organs is due to lack of moderate contraction or tone necessary for peristalsis.

The observations made on lower animals can be duplicated in men. My former colleague, Dr. Alvarez, has reported autopsies on patients who died from the toxin of botulism; in their

stomachs food was still present which had been eaten many days before, when the disorder started. Similar stagnation is often noticed in men and women who have died from tuberculosis and other infectious disease. It is of interest that Beaumont, the pioneer American physiologist, who made careful observations on Alexis St. Martin, the man with a hole in his stomach, reported on one occasion that his patient complained of headache, lassitude, dull pains in the left side, had a furred tongue inclined to dryness, and a generally sallow countenance. In these circumstances, Beaumont noted that St. Martin's stomach was still full of food six hours after a small breakfast. When he suspended an oyster in St. Martin's stomach, by passing it through the artificial opening, he found, on withdrawing it after two hours, that it was only partially digested. Here again is evidence that symptoms of general indisposition were associated with striking disturbances of the processes in the stomach.

Debilitating disease is not the only condition accompanied by failure of proper tone and by consequent inactivity of the digestive organs. Their services may be interfered with by severe and exhausting labor. Thus, very strenuous and prolonged muscular effort may bring on a condition of fatigue in which the stomach does not respond normally to the intake of food for an hour or two. It seems possible that the central nervous system is depressed by exhausting activity and that consequently a tonic state is lacking in the whole gastro-intestinal tract, accompanied by absence of normal secretions from the digestive glands. Alvarez has remarked, "One ought to be at least as careful of oneself as an experienced horseman is of his steed when it brings him home from a long journey. He would never think of feeding it immediately, but always ties it up for an hour or two so that when it feeds it will not be seized by an attack of colic." Furthermore, Alvarez remarks, on the basis of large experience, that a man who sits down to a hearty meal after an exhausting physical effort will occasionally suffer afterwards for several days with abdominal pain, flatulence and diarrhea. Sometimes the food will pass through the whole digestive canal decomposed but not digested. Again we note, in human cases, that the digestive tract participates with the rest of the body in depressing conditions.

Besides the influence of the vagus nerves on the muscles of the alimentary canal there is the influence of these nerves, and the associated nerves governing the salivary glands, in calling forth the digestive secretions. Many years ago the great Russian physiologist, Pavlov, reported that besides the well-known watering of the mouth, *i.e.* the psychic secretion of saliva when pleasant food is smelled or tasted, there is also a watering of the stomach, *i.e.* a secretion of the gastric juice. It has been discovered, furthermore, that there is a psychic secretion of the pancreatic juice. The discharge of digestive fluids from the glands of the stomach and from the pancreas depends upon the vagal nerve supply to these organs. These so-called "psychic secretions," occurring at the first appreciation of the pleasures of appetite, are highly useful in starting the process of digestion in a satisfactory manner.

In 1911 I suggested that besides the

psychic stimulation of the digestive glands due to the agreeable odors and flavors of food there might be also a psychic increase of muscular tone in the stomach and intestines—a state resulting from nervous impulses when food is relished either in anticipation or at the time it is eaten. When I made that suggestion I had observed that exclusion of vagal impulses shortly after feeding did not interfere seriously with the digestive process already started. It seemed, therefore, that the pleasurable eating of the food was associated with some action of the vagus nerves on the stomach which established in it a persistent state of tension. Thus, when food is taken with satisfaction and enjoyment these nerves might establish a tonic condition of the gastric muscle much as they start a secretion from the gastric glands.

The suggestion and the evidence for a psychic tonus of the gastro-intestinal tract have received support from clinical observations. A patient had a large opening or hernia of the abdominal muscles; in that region the intestines were so thinly covered by skin and the deeper membranes that the contractions of the intestinal coils could be easily seen. The remarkable fact appeared that whenever a nurse approached bringing food, peristaltic waves could be seen as they moved along the small bowel, and also active kneading movements. It has been noted, furthermore, by means of the Röntgen rays, that food will advance more rapidly in the intestines if a second meal is given a short time after the first. In these circumstances the second meal acts to increase the tone of the intestinal tube and therefore serves to stimulate peristaltic activity. It is an observation of considerable importance that digestion progresses more rapidly if the viands which are eaten are palatable than if they are not. Bearing on this evidence is the testimony that when a patient ate of his own volition the intestinal contractions were much more active than when he was plainly annoyed by being fed by the nurse.

All this testimony indicates the intimate relations between the proper functioning of the digestive tract and the general state of the organism. If the tract functions satisfactorily the energy-yielding food becomes the means of supporting all the activities of our bodies in a highly efficient manner. Then there is a beneficent circle of good digestion assuring general bodily well-being, and general bodily well-being assuring good digestion. On the other hand, if there is debilitation or weakness, as a consequence of exhaustion, whether from excessive labor or prolonged disease or acute infection, so that the normal moderate degree of nervous activity or tone is greatly reduced, the muscles of the gastro-intestinal tract share the tonelessness of the muscles of other parts of the body, and in consequence the digestive organs are not able to carry on vigorously their normal functions. In these circumstances it is clear that a vicious circle may be established, such that the debilitated organism does not receive the nutriment which is necessary for its upbuilding and thereby the debilitated state becomes accentuated. When this condition prevails the service of the skillful physician or the intelligent nurse is required. Food must be served delicately and temptingly and in small amounts. It must be food easily di-

gested. It must appeal to the appetite by agreeable aroma and flavor. If these precautions are respected the prevailing vicious sequence of disturbed digestion and bodily weakness may be broken into by exciting to some degree the fundamentally important tonic nervous impulses.

I now wish to turn your attention to the other set of nerves, those of the sympathetic system which have an inhibitory or checking action on the digestive secretions and the movements of the gastro-intestinal canal. These nerves are especially brought into action by worries and anxieties and other forms of emotional upset. The extreme sensitiveness of the stomach and intestines when emotions are involved has long been recognized. The Bible refers to "bowels of compassion," a phrase which points to a belief, centuries old, that the intestines participate in the expression of deep feelings. Observations on lower animals have fully justified the ancient belief. When a loop of dog's intestine was arranged so that it could be observed under the skin, its tone and activity were seen to be constantly changing, as someone approached the dog, or there was a patting of his head, or a look of reproof, or the mew of a cat. When the nerves were severed the intestine was no longer "sympathetic" and "compassionate." Innumerable cases could be cited to illustrate the abolition of the movements of the stomach and intestines in human beings because of the influence of strong emotions. Alvarez has described a patient —an excitable young man—who, as the Röntgen rays revealed, still had in the stomach the meal eaten six hours before. Examination showed that no organic fault existed. Then inquiry brought out the fact that the patient had been greatly distressed by a quarrel in a society to which he belonged, a quarrel which was to reach its climax within a few hours. Another case, a woman with intestinal coils which, like those of the dog I have just mentioned, could be seen through a thin covering of skin, had a total stoppage of all activity of these coils when there was momentary fright or anger.

Strong emotions may bring to a standstill not only movements of the stomach and small intestine but also movements of the large intestine. The victim of a bad railroad accident has been reported by Hertz, a man who for more than half an hour was buried in the wreckage of the cars. Although having normally the most regular habits, he was so deeply affected by the horror of his experience that through several days his bowels could not be made to act in spite of the use of all sorts of agents to stimulate them.

Coincident with an interference with the muscular activities of the alimentary canal induced by strong feeling is the interference with the secretions of the digestive glands. The dry mouth of the anxious person called upon to speak in public is a common instance. Another instance is seen in the "ordeal of rice" as applied in India. This was a practical utilization of the knowledge that excitement is capable of stopping the flow of saliva. When several persons were suspected of a crime, consecrated rice was given to all of them to chew; after a short time it was spit out by each one upon a leaf of the sacred fig tree. If anyone ejected it dry that was taken as proof that fear of being

discovered had stopped the secretion, and consequently he was adjudged guilty.

What has been known for centuries as true for secretion of saliva has been proved true also of the secretion of gastric juice. Opportunity for such observations on human beings is offered when surgeons have to make an artificial opening into the stomach because of closure of the esophagus. In these circumstances the patient must chew his food as usual and then let it be carried to the stomach in a tube inserted through the artificial opening through the abdominal and gastric walls. In one case of this character which was carefully studied the boy chewed agreeable food and was seen to have, as a consequence, an outpouring of gastric juice. If he became vexed, however, and began to cry, the chewing of agreeable food shortly thereafter was not attended by the usual appearance of the gastric secretion. The interesting point in this case and in other similar cases is that the effect of a passion lasted for a considerable period after serenity had been restored. While the effect of the emotional upset persists, the chewing of food, even though it may have a pleasant taste, does not produce the usual stimulant effect on the gastric glands.

Many of us may have had experiences suggested by the results which I have just described. We note that if we have been agitated by an incident which rouses strong feelings within us we do not immediately recover our previous calm. In lower animals it is possible to study quantitatively the degree of interference with the digestive secretions produced by emotional excitement. Thus a dog, excited for 5 minutes by the presence of a cat and then fed in the usual manner, secreted during the twenty minutes which ensued only a few drops of gastric juice; the routine amount produced during that time was nearly two teaspoonfuls. The pancreatic juice likewise may not be secreted if excitement prevails; merely bringing a cat into a room where there is a dog may completely stop the dog's pancreatic secretion. Obviously the digestive glands are as readily deranged as are the digestive muscles when sympathetic impulses are discharged in excited states.

One of the great disturbing emotions, fear, may be regarded as anticipated pain. On this basis we might expect that pain would produce the same effects as fear. This, indeed, is found to be true. Painful stimulation brings the sympathetic system into action much as great excitement does, and consequently has a similar influence on alimentary functions. An instance has been cited of a little girl who fell from a fruit tree early one morning and broke her arm. The distance to the doctor's office was long, and the journey with horse and buggy was painful. At noon the parents and their daughter reached their destination. The first whiffs of the anesthetic caused the girl to vomit. The gastric contents thus discharged had been so little digested that they still showed the marks of the teeth bitten into the fresh fruit.

About 42 years ago when I was using the newly discovered Röntgen rays to watch the motions of the stomach, I was much annoyed because some of the cats under observation revealed no gastric peristalsis whatever, although, like the others showing normal peri-

stalsis, they had eaten eagerly. A clue to the difference between the sorts of conditions was presented when a mother cat was being observed while her kittens were in another room. So long as she remained quiet and contented the peristaltic waves coursed routinely over the gastric wall. When she turned from this state, however, to one of restless excitement, the movements immediately stopped, the stomach became wholly relaxed, and only after she had been petted and began to purr did the driving waves start again. Many times thereafter I had occasion to note that any condition which was accompanied by signs of worry or anxiety stopped completely the movements of the stomach.

When I first saw that strong emotion or even signs of anxiety were accompanied by stoppage of the gastric contractions, and afterwards when I learned that these states of mind were associated with a depression of the activities of the digestive glands, a depression which might last for a considerable period, I thought that this interference with the fundamental and beneficent process of digestion might be avoided by surgically cutting the sympathetic nerve filaments along which the inhibitory impulses passed. At that time, however, I did not understand the organization of the sympathetic system and the arrangements for a diffuse distribution of its influence, and therefore I did not realize how widespread the effects of its activity might be. The interference with the digestive process by excitement is only an incidental part of the total picture. We shall be better oriented with regard to it if we examine the accompanying functional limitations which strong emotion induces.

In order to have insight into the complex of changes attendant on emotional excitement we must understand the way in which the sympathetic system discharges its impulses. As you may recall, it is made up of a series of ganglia on either side of the midline at the back of the chest and abdomen and of nerves which connect these ganglia with the spinal cord. The fibers of these connecting nerves are distributed up and down the chain of ganglia so as to produce an interlocking control. In each ganglion which these fibers touch there are connections with the ganglion cells. This organization provides for a widespread distribution of nerve impulses discharged from the ganglia to the various viscera—heart, liver, spleen and gastrointestinal tract. The sympathetic system, furthermore, is connected with the adrenal medulla; it causes that internally secreting gland to discharge adrenaline into the blood stream. This powerful substance has almost everywhere the same effects as the sympathetic nerve impulses. Indeed, we can regard the sympathetic system as a sympatho-adrenal system.

By depriving the heart of its nervous connections through a surgical operation it is possible to use that organ as an indicator for circulating adrenaline. This so-called "denervated heart," connected with the rest of the body only by the blood stream, is extremely sensitive to a very slight increase of adrenaline in the blood. If an animal is quiet the denervated heart will beat slowly, perhaps 120 beats per minute. Strong excitement will send the rate up to 200 or even 220 beats a minute.

If the adrenal glands are excluded from action this great acceleration of the pulse does not occur. It is clear, therefore, that excitement is accompanied by discharge of adrenaline into the circulating blood—at least in experimental animals. There is evidence, however, that the same change occurs in human beings. It is now not uncommon for surgeons to cut sympathetic nerves to relieve spasm of the blood vessels of the fingers in Raynaud's disease. A surgeon who had performed this operation was quite proud of the remarkable change in his patient from the cold, blue fingers to warm and pink ones, as a consequence of his skill. He took a group of medical students to see the patient and while in her room detailed the previous condition and the surgical procedures responsible for the good result. Dramatically he pulled down the bedclothes to show the hand; the fingers were as blue and as cold as ever! In much chagrin he went to his office in the hospital. There it was suggested to him that presence of the students might have caused an emotional upset and discharged adrenaline which contracted the denervated blood vessels. He returned to his patient and found the fingers once more pink and warm. Subsequently small amounts of adrenaline, introduced into the blood stream, proved that the emotional discharge from the adrenal glands could explain the observed phenomenon.

If adrenaline is injected there is an increase of sugar in the blood. In accord with the evidence that excitement discharges adrenaline, the observation has been made that if cats are excited by a barking dog there is a rise in the sugar concentration of the blood—an effect which does not occur in the absence of the adrenal glands. Here again, the results obtained on lower animals are seen likewise in human beings. On good authority I have an account of a victim of diabetes who depended upon chocolate, which he carried with him, to protect him against a too large dose of insulin—a dose which might lower the blood sugar to an uncomfortable level. One morning after an insulin injection this man was walking to his office and noted that he was beginning to feel somewhat dizzy and incoordinated, the signs of a low sugar concentration. Reaching in his pocket he discovered that he had no chocolate to take for his own protection. On entering a drug store he attempted to buy some sugar from the druggist. His speech was so thick, however, and his motions so unsteady that the druggist, thinking him intoxicated, threw him out of the store. The patient was thoroughly infuriated by this treatment and then, to his astonishment, found that the symptoms had disappeared! It is of interest that after severe examinations in college and medical school, and also after exciting football games, the blood sugar may rise so high in the participants that it passes the barrier presented by the kidneys.

The familiar increase of heart rate and of blood pressure which attends emotional excitement need not be stressed. Accompanying these changes, however, there is a redistribution of the blood in the body so that it is delivered in much less volume to the digestive organs and in much greater volume to the heart, to the brain and to active muscles. And another accompaniment of these changes is an increase

in the number of circulating red blood corpuscles; these extra carriers of oxygen are discharged by contraction of the spleen in which organ they are stored.

It is well known that adrenaline induces relaxation of the small air tubes or bronchioles of the lungs. The common use of this agent to relax the spasm of the bronchioles in asthma illustrates this action. That excitement may discharge adrenaline effectively in man is further proved by an experience of a friend of mine in London who occasionally has severe attacks of asthma. His usual course in that circumstance is to go to the country to be free of the irritating smoke of the London atmosphere. On one occasion, while breathing heavily because of the asthmatic attack, he found himself in a London suburb in his automobile going down a steep hill. At the bottom was a sharp turn of the road, with high stone walls on either side. About half-way down the hill be discovered that his brakes were not operating. In desperation he tried the emergency brake and the reverse, and finally by his efforts barely avoided being dashed headlong into the stony barrier as he made the turn. To his great astonishment he found on once more getting control of the car that his asthma had quite disappeared!

Still another effect of adrenaline is an abolition of the effects of muscular fatigue. Whereas fatigued muscle, much less responsive than before its activity, will recover its responsiveness in the course of an hour, a small injection of adrenaline into the blood stream will restore its original sensitiveness in a few minutes. Possibly the great feats of strength and endurance which are reported when men are laboring under great excitement may be explained by this defatiguing effect of adrenal secretion.

Finally, injected adrenaline can produce a faster clotting of blood. There is evidence that the discharge of adrenaline from the adrenal medulla has similar effects. Thus, if the nerves which are distributed to this organ are stimulated, the clotting time is notably shortened, and if excitement occurs so that there is a normal physiological discharge from the adrenal glands the clotting may occur in less than a third of the usual time.

These various changes accompanying deep emotional disturbance seem disconnected and independent facts. By considering them in relation to the natural accompaniments of great fear or great rage, however, we find a clue which gives them all a common explanation. In wild life and in the primitive existence of man the necessity of a struggle for existence was a common fate. Foes were on every hand, and only by being alert could life be preserved. Fear has long been recognized as the accompaniment of the instinct to run away or to escape; and rage is the accompaniment of the impulse to fight or attack. Fear and rage are closely related. The psychologist, William James, pointed out that we "both fear and wish to kill what would kill us." Furthermore, rage is related to many instinctive acts. One needs only to thwart these instincts—attempt to take food from a hungry dog or seize the offspring in the presence of the mother—and rage, with the fighting instinct, is at once aroused.

The necessity for struggle, either fighting or running, calls into action all of

the great muscles of the body, perhaps in a supreme effort. Then an increase of sugar in the blood would be advantageous in supplying the energy for prolonged muscular exertion. The abolition of muscular fatigue by adrenaline would allow the muscles to continue acting for a longer time. The rapid heart, the increased blood pressure, the higher concentration of red corpuscles in the blood, would bring to the laboring muscles the oxygen which is needed to burn their acid waste products. The dilation of the bronchioles would allow the faster breathing to occur without greatly increased friction. And the more rapid clotting of the blood would help to preserve that precious fluid if there should be injury. These changes all fit together as rendering the bodily forces more effective in struggle.

Note that the readjustments in the circulation call for a contraction of the blood vessels of the abdominal area and a shifting of the blood so that there is a greater volume flow per minute through the vessels of the brain and the heart and the active muscles. In these circumstances digestion is impossible because of lack of proper blood supply to the digestive organs. When there is a great emergency, when life is at stake, the digestive process has a minor importance. It can be temporarily set aside.

In the conditions of civilized society we may have as great perturbations of the body because of an emotional experience as we might have if we were in the wilds of the jungle. A student undergoing an examination, or a stockbroker watching a ticker, or a patient being wheeled to an operating room may be greatly excited. Observe that in none of these instances is effort called for. Ingrained in our nervous organization, however, is the pattern of an adaptive emotional response which we have inherited from remote ancestors. The digestive process, therefore, may be profoundly upset by idle excitement, almost as much upset as if the utmost physical effort was being anticipated. Only by understanding the whole combination of reactions to fear and rage can we perceive the meaning of emotional derangement of the digestive process and realize how foolish it is to allow the organism to mobilize all its forces for struggle and thus interfere with the work of the digestive organs when no struggle is demanded or is even possible.

What advice may be given for avoiding the harmful influence of emotions on the digestive process? Since we may regard the total complex of bodily changes associated with fear or rage as preparations for struggle, we may take a rational attitude toward an exciting incident. If there is action to be engaged in the excitement should run its full course. On the other hand, if nothing can be done in the circumstances it is obviously unwise for the disturbance to continue, especially when the fundamentally important functions of digestion are being stopped. You may object that this is a counsel of perfection—that it is impossible to check the emotional excitement. From personal experience, however, I have found that in the presence of a situation in which activity is unnecessary or useless I have been able to take a rational attitude which has, I believe, minimized the extent of the internal disturbance.

If interference with digestion results from a continuing situation the removal of that situation should be sought. Alvarez tells of one of his patients who for days had a marked disturbance of digestion and who recovered only when he learned that she was worried about a tax bill and, as a mode of treatment, he paid the bill. Again, if an object or situation has been associated with a great emotional experience so that the circumstance, ordinarily insignificant, now conditions a return of the experience and thereby interferes with digestion, the object or situation may be confronted repeatedly until it loses its effect or it may be avoided altogether.

Still another suggestion which may be offered is that when the occasion arises which provokes a degree of excitement which cannot be controlled, the bodily preparation for activity may be worked off in hard physical labor. Often the excited state can thus be reduced and the body, instead of suffering a prolonged disturbance, is fairly soon returned to its normal state.

AN APPROACH TO THE HOSPITAL PERSONNEL PROBLEM[1]

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THERE is general recognition today of the growing importance of personnel management, of the necessity for proper procedures in administrative work as it pertains to the personnel of our institutions. Hospital organization differs from that of industry in a number of ways. One of the principal differences is the absence of the profit motive. There is no question of distributing profits as the result of the operation of these institutions (except those of proprietary nature). Hospitals are dependent upon public support either through taxation or as is the case with the majority (the voluntary hospitals), upon the generosity of the charitably inclined. Hospitals simulate industry in that collectively they employ large numbers of people; they also conduct many activities which have their counterpart in business enterprises.

From the viewpoint of their historical development, hospitals are unique in many respects. Religion, war, the advances of science, as well as developments in industry and in the social life of the public have exerted marked influences upon them. Until fairly recent years, hospitals were established and operated primarily for the care of the indigent sick. Many were and still are conducted under church auspices. Employees were recruited from the ranks of those who were imbued with high ideals of service; from the ranks of those who were chronically ill, partially disabled or who were convalescent from illness; often from among those who were homeless and from among those who were practically illiterate or who had but little education, and no skill in the trades, who for these various reasons could not find employment in industry. The wages paid were meager. Compensation for many consisted primarily of board and room with but a small cash allowance. Hospitals depended to a large extent upon the good will and upon the ideology of these employees.

In the small institutions (of which there were and still are a great many) the close relationship between employees and their superiors in the organization fostered this situation. In the last several decades hospitals have grown in size and number. The number has tripled since 1900 with a tremendous increase in the number of beds and in the size of many institutions. This expansion has been accompanied by an increase in the complexity of organization. Personal contact in many instances between chief executive officers and subordinate employees such as existed years ago is no longer possible in the large hospitals found chiefly in the urban centers.

This expansion has made it necessary to recruit employees from other sources. Those with homes in the community do not care to live in the institutions. Higher wages became necessary and competition with industry for workers became more evident. Practices have necessarily changed. Hospitals no longer

[1] Read before the General Session, American Dietetic Association, Milwaukee, October 13, 1938.

house the majority of their employees; in many, the dormitories for workers have entirely disappeared. Increased building costs made it necessary to use construction funds primarily for facilities for the direct care of the patient. Employees, living in their own homes or apart from the hospital, become part of the general community and are no longer segregated as a special group whose whole life centers about the institution. They fraternize with associates employed in industry and in other community activities. They participate in the discussions of their social groups and are influenced by the same factors that affect their friends and associates.

These developments have brought to the hospital a demand upon the part of the employees that they be treated as are employees in other fields. The time has passed when hospital employees can be regarded as a special group. Hospitals must consider the rights and privileges of their personnel as members of the community, as working people. They cannot continue to require that they give so much of themselves for meager compensation; that they make such large personal sacrifices in order that the institution carry on charitable work to others.

Certain basic factors must be considered in any approach to the problem of personnel relations. I have before me an address entitled "The Needs of Everyman" by Howard E. Collier, M.B., Ch.B. of the Department of Hygiene in the University of Birmingham, England, who spent considerable time in this country as well as in England studying conditions in industry. In this lecture, he asks "What are human beings trying to get out of their work?" Three answers are given:

> (1) the materialist answers—bodily sustenance is man's only important need. . . .
> (2) the individualist replies—not only sustenance but personal liberty and equal justice. . . .
> (3) the authoritarian or logically minded socialist says—for a full life man needs to subordinate himself to society.

Mr. Collier then develops his thesis that there are three needs or groups of needs which life must satisfy for men before they can live full lives as harmonized, integrated human beings. "These basic human needs are

> (1) The need for sustenance and reasonable physical security.
> (2) The need to be a person.
> (3) The need to be socially integrated and to possess reasonable social security (that is to be a member of a significant and an enduring group).

The economic needs do appear to be paramount but alone they do not give complete satisfaction. Each of us desires recognition as an individual, as a person of some consequence and wants also to feel that he is a member of a stable, social group. These we must recognize as basic factors in all dealing with our employees.

Years ago when the subordinate members of the hospital family had little education, few of them having completed the elementary school grades, their wants and desires were not the same as confront administrators today.

Education raises the desires and hopes of the individual and many of those in the most menial positions today have passed through the secondary or high schools. They desire a fuller life; an income that will provide more than mere sustenance; recognition as an individual and recognition as a unit in the whole social scheme of life. These factors must be borne in mind when approaching the problems of personnel relations.

The economic factors are easily recognized, the personal and social elements are usually submerged and less in evidence even in the mind of the employee. Stress is placed upon the economic factor in times of unrest, but even though a high rate of compensation is paid, the worker will not be happy if his environment while at work is not congenial or if his interest in his work is not a sustaining one. If interests are turned primarily to after-work activities, to the pleasures of the evening, the hours of duty will be unhappy ones. The chronic clock-watcher is never a happy individual.

It is important therefore to look beyond the satisfying of economic needs and to endeavor to secure a balance of these three factors. In hospitals comparatively little attention has been paid to the principles of sound organization. These require that there be a clear understanding of lines of authority and responsibility. Hospitals have become complex and rather intricate organizations. Provision must be made for the proper conduct and integration of numerous activities if effective service is to be performed. It is well to have a chart of the organization indicating the manner in which the several departments will function, which activities each will perform and how they shall be interrelated.

Such functional chart will provide the basis upon which a further analysis can be made. This analysis should disclose the variety and number of positions necessary for the work of each division of the institution. Each position should be visualized, its duties described in considerable detail and its merits with respect to other positions in the same division and to positions in other divisions or departments clearly set forth. Such an analysis of all positions in the hospital will provide a blue-print or chart of the entire organization on a functional basis upon which a proper personnel program can be developed.

Such classification of positions or job analysis has been made in a number of institutions. The duties assigned to each position are first carefully enumerated and recorded. The qualifications of employees deemed essential in filling each position are likewise determined and recorded. Duties and qualifications are then analyzed in something like the following manner:

Work Factors may be enumerated in three groups: namely, duties, supervisory responsibility, and public contacts. These are then subdivided after the following fashion:

A. Duties
   1 Few, simple tasks, repetitive in nature
   2 Semi-skilled, routine tasks
   3 Higher routine (more involved than 2)
   4 Varied and requiring limited judgment
   5 More complex, with mid-grade judgment

6 Such as require constant exercise of general judgment
7 Higher judgment, with unusual training and experience

B. Supervisory responsibility
0 None
1 Distribution or assignment of routine work
2 Supervision of small group or section
3 Immediate responsibility for larger section
4 Responsibility for a large department

C. Public contracts
0 None
1 Reception and transmission of messages
2 Frequent but not confidential
3 Routinely and of confidential nature

Personal Factors may be enumerated in four groups such as, age, education, special training and experience. These may be subdivided in the following manner:

A. Age
1 Minimum, allowable by law
2 18 to 20
3 20 to 25
4 25 to 30
5 30 to 35
6 Over 35 to maximum determined by institution

B. Education
1 Grade school
2 High school
3 One or two years of college
4 College graduate
5 Professional or graduate education

C. Special training
One or more points as indicated

D. Experience
0 None
1 Some practical experience
2 One or two years
3 More than two years
4 As a minor executive
5 Several years in responsible position

This is of necessity but a brief outline, but will serve as an indication of the approach to the task. With such outline as a guide, each position is studied and evaluated. Thus a cleaning maid's position might be evaluated as follows:

Work Factors:
A. Duties, few simple repetitive tasks..... 1
B. Supervisory responsibilities (none)..... 0
C. Public contacts (none)..... 0
Personal Factors:
A. Age (20 to 25)..... 3
B. Education (grade school)..... 0
C. Special training (none)..... 0
D. Experience (some)..... 1
Total points..... 5

From such minimum the classification would extend to a maximum of 30 or more points. The scale can be extended as one may desire or as may be indicated in order to provide a proper classification.

With all positions in the hospital classified in some such manner a proper salary schedule can be formulated which will recognize the comparative value to the institution of the various positions. Such classification may also serve as a guide to employee, department head, and administrator when considering advancement or salary increases.

In the Food Service Department at the University of Chicago Clinics, an

analysis of this kind developed sixteen classifications or groups of positions:

1. Administrative Dietitian—Head of Department
2. Cafeteria Manager
3. Head Cook
4. Main Kitchen Dietitian; Senior Therapeutic Dietitian
5. Dietitians — assigned to various duties
6. Second Cook; Pastry Cook
7. Assistant Cafeteria Manager
8. Third Cook; Butcher; Storeroom Keeper
9. Cost Accountant
10. Head Waiter; Food Storage Clerk
11. Diet Kitchen Cook; Vegetable Cook
12. Senior Porter; Chief Dish Washer
13. Typist; Cashier; Pastry Cook's Assistant
14. Head Vegetable Preparation Girl; Cafeteria Girls
15. Assistant Porters and Dish Washers
16. Service Kitchen Girls; Pot Washers, etc.

These designations are indicative of the functions which this department performs; they would not apply in many other institutions but are cited to convey an idea of the results of such a study. Using this job analysis as a basis, a salary schedule ranging upward from a minimum of $65.00 per month for women and $75.00 per month for men was established. The salary stated was inclusive of all forms of compensation. Board, room and laundry were each given monetary values and deductions were made from the base salary if such perquisites were given the employee. In this department, three meals per day are provided for most of the employees. These are given a value of $15.00 per month and deduction is made from the salary rate accordingly. The salary schedule adopted provided for an increase six months after initial employment; another advance twelve months later (eighteen months after initial employment) and a final advance eighteen months later; *i.e.* maximum salary for the position at the end of three years. Each advance is contingent upon a favorable report from the head of the department concerning the employee's aptitude, attitude toward the work and general efficiency. No increase is granted unless merited on this basis. A salary schedule of this type supplies some stimulus for good work and is one factor in building a proper morale among the employees. For the guidance of the administrator and better to provide for fair dealing with employees, also to provide a basis for the department heads' recommendations for salary increases and promotions, some mechanism for reporting on the efficiency of employees should be adopted. Opinions concerning and judgments of an employee's work may easily change in the course of six or twelve months. Recorded ratings of efficiency at stated intervals (three or four months) are of material assistance in maintaining a proper performance of duty, particularly if the employee is informed of his rating and admonished if it is low.

There are many "dead-end" positions in the hospital organization. Efforts should be made to eliminate as many as possible. Opportunity should be provided for employees to advance to better positions, either in the same or some other department. Programs for instruction and training whereby they may fit themselves for advancement may well be undertaken.

These steps—a proper organization, job analysis, job rating, efficiency reports, salary schedules and opportunities for advancement—are essential parts of a personnel program. Equally important is the procedure followed in employing the new worker. The applicant should be required to give a brief biographical sketch in writing, enumerating in addition to complete identification data, his education and training, former experience, positions held, etc. References should be checked and aptitudes and intelligence determined so far as this is possible. The qualifications prescribed for the position should be carefully compared with this information and an endeavor made to select the applicant who best meets the requirements. The new employee should be given specific information concerning his position—the duties to be performed, the terms of his employment, the content of the personnel relations program. This should preferably be given orally and confirmed by printed or typed rules and regulations. Be careful not to make statements or promises that may not be fulfilled.

Similarly, a definite procedure for censure, discipline and dismissal should be established. Peremptory dismissals should be the exception and only resorted to in case of the most flagrant failure to perform assigned duties or violation of regulations. Tolerance and justice without weakness or the winking at repeated petty offences should mark the practice.

Other elements enter into a sound personnel program. Among these may be listed definite regulations concerning vacations, absence because of illness, bereavement in the family, or for personal reasons—whether or not such privileges and others will be granted with or without pay. Most hospitals provide in one manner or another for health and hospital service to employees. Definite regulations concerning such service should be established. The program should further take into consideration the question of annuity or retirement. So long as hospitals are exempt from federal laws relating to social security, it is incumbent upon them to make provision for their employees who have grown old in the service. If this is not done there is danger of retaining employees when they can no longer render effective service to the detriment of the younger workers and the whole organization. To dismiss them without provision for their livelihood is unjust.

Attention should be given to the development of sound safety practices throughout the hospital. Health hazards, beyond those encountered by the general public are always present and employees should be taught how to guard themselves against such hazards. Proper technics should be established in dealing with them. The greatest number of minor accidents are quite regularly reported from the dietary departments—burns, knife cuts, cuts from broken china and glassware, sprains and strains from slipping upon the floor, from lifting heavy weights, etc. All precautions possible should be taken to avoid or prevent such occurrences.

The well-balanced personnel program will also include some mechanism by means of which recognition can be given for particularly meritorious service and for efficiency over a period of years. Many industrial establishments and

public services have long recognized such performance by the service stripe, button or badge. Employees take pride in such acknowledgment of faithful service.

Though all of these provisions are made; though the best balanced program, so far as these various elements are concerned, is established, it will not suffice unless the personnel officer (if there be one) and the department heads approach their tasks with genuine interest in the employee, with breadth of vision, tolerance, fairness, and a sympathetic understanding of human relations.

The employee's immediate superior is a most important factor in the whole scheme. Some of those present heard me quote a foreman's[2] "Do's and Don'ts" at the Tri-State Hospital Convention in Chicago last spring. These rules of conduct for the foreman or for any supervisor or department head made a deep impression upon me and I give them to you with the hope that you will find them helpful in your work:

> Avoid too much interest in self and show more interest in the worker—an interest in his progress with the company, his health, his home affairs, his hobbies. Talk to him occasionally about his favorite fishing hole, his new back porch, his children. Sympathize with and help him in his troubles and learn to call him by his first name, or his nickname if he prefers that.
>
> Show appreciation. The worker craves genuine heartfelt appreciation. It is human nature. Appreciation must not be confused with flattery. Flattery is counterfeit. The worker detects it. Genuine appreciation is from the heart out. There are too few expressions of genuine appreciation by foremen.
>
> Avoid cynical fault finding. The worker will not tolerate it. It breeds hatred, unrest, contempt and rebellion. When disciplinary action is necessary, first get all the facts, then criticize constructively, in private with the worker, never before others. To criticize a worker publicly is deeply resented. If criticism is necessary, be fair, impartial, firm. Act in the rôle of a teacher, not a critic.
>
> Make the worker feel that he and his job are important, that he is more than just a cog in the wheel. The desire to be important is the deepest urge of human nature. Allow him to display his importance by asking his opinion and viewpoint in matters concerning the department, and this applies to the apprentice as well as to the experienced worker. Delegate responsibility, if ever so small. Most men feel more important to the company when a certain amount of responsibility is delegated to them.
>
> Avoid an argument with the worker. It creates ill feeling. If you best the worker in an argument he will never be convinced you are right. If the worker gets the best of it your position will be belittled. You can always win an argument by avoiding one.
>
> Provide good working conditions. Foremen should give attention to good housekeeping in the department—safety appliances, ventilation, lighting, ample equipment and supplies, and sufficient equipment maintenance.
>
> Cultivate the "we" feeling. Make the worker feel that he is working with you, not under you. A friendly attitude brings a friendly response.
>
> Assign tasks to the worker comparable with his ability and then go

[2] Harold F. Browne: Industrial Management Division, Conference Board Service Letter, 11: 3, March 31, 1938.

out of your way to help the worker perform the task right, if he needs help. Do not impose upon the worker unreasonable hours, a decrease in wages, or make radical changes in his working conditions without first talking it over with him.

Understand the attitude of the individual worker, whether he be radical, indifferent, or narrow-minded. Be tolerant, never jump to conclusions, get all the facts. The worker may have had only a half understanding in the first place. Try to change that unfavorable attitude with proper psychology.

Recognize ability with promotion and wage increases, when the opportunity is available, instead of importing new help from the outside for these better positions. The advancement of one will have a favorable effect on all the workers. Make good all promises to the worker and see to it that all department grievances are promptly adjusted satisfactorily.

Eliminate the little job irritants. Keep close to the worker and find out what is on his mind. Trivial irritants must be removed or the foreman will soon find himself sitting in the middle of a giant cannon cracker with the fuse burning.

Maintain rigid discipline in the department but do so by exercising intelligent leadership and not by Simon Legree methods. You must secure the fullest cooperation from the worker and establish between you a mutual understanding. Above all, be considerate, be fair, and be human.

The task of the administrator, of department heads and of all supervisors of employees is that of establishing proper relationships with and between the personnel and of constantly adjusting them. The importance of the human relationships cannot be overemphasized. To do our tasks properly we must first be masters of ourselves. These "Do's and Don'ts" contain much that is of value to each of us.

Hospitals are established primarily for the care of the sick. The duties of every officer and employee have as their objective the best possible service for the benefit of the patient. Each of us should be genuinely interested and enthusiastic about our work, otherwise we have no business in this field of human endeavor. Every employee, incinerator operator, floor maid, dish washer, engineer, nurse, dietitian or executive officer should understand that the work he or she does is essential for the proper care of the patients, even though they may never see them. Because of the nature of the hospital's service, we, the executives, have a far better opportunity to develop esprit de corps among the employees than do many industrial enterprises.

Many institutions, particularly the larger hospitals, have found it to be in their interest to employ a personnel manager. It is my opinion that this officer will take on increasing importance with the years. It is difficult to obtain uniformity of practice in the execution of a personnel policy or program when there is reliance upon a number of different department heads who are primarily concerned with the functions of their respective divisions rather than with the individuals who perform those functions. When there is one officer responsible for the conduct of the personnel relations program better results are to be expected. Such officials should be welcomed rather than resented by department heads for they have much to

contribute to the effective operation of the organization.

A satisfactory approach to the personnel problem can only be made if careful consideration is given to the physical, personal and social needs of the employees. I have outlined some of the elements that should enter into a sound personnel program and have endeavored to stress the importance of the human relationship. Much more could be said concerning the social aspects of the question. The intimate social and personal relationships of small groups of employees are of great importance. Most of our institutions are comparatively small, particularly when comparison is made with industrial establishments. We speak of the hospital family and should do more to knit our employees into closer bonds of friendship and social union. In the address by Dr. Collier to which reference was made, he stated: "We can observe, I think, that wherever conditions are healthy and favorable, the basic social unit in an industry is a small group or 'society' of friends. Wherever conditions are favorable, these basic 'groups' are to be found repeated, 'layer by layer' right up into the highest levels of management. In a healthy industry, all three fundamental human needs for sustenance and reasonable security, for personal satisfaction and for adequate social living, are being met. . . . Unfortunately, the formal organisation of modern industry with its regular, stereotyped structure of management and subordinate supervision, usually approaches nearer to the structure of a regiment or an autocracy than to a society of friends. Whenever the formal structure hinders the growth of an organic society of friends, frictions and social stresses begin to appear."

Form and structure are essential in an orderly organization but we must not permit rigidity of rules and strict adherence to form, to interfere with the development of our personnel relations in which a true understanding of social values and human relationships is so vital.

NOMENCLATURE AND HUMAN REQUIREMENTS OF THE VITAMINS[1]

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SO MANY terms have been applied to the vitamins, such a variety of units suggested and so much variation displayed in prescribing for human requirements, that it may be helpful to many to have a summary presenting a plausible nomenclature, international unitage and probable human requirements.

In the spring of 1937 the Committee on Vitamin Nomenclature made the following recommendations to the American Society of Biological Chemists and the American Institute of Nutrition:

> 1. That the vitamin which is recognized as a specific in the prevention or cure of beriberi in man and polyneuritis in experimental animals, and which has been identified as consisting of a 2 methyl 4 amino pyrimidine group and a 4 methyl 5 B hydroxy ethyl thiazole group joined by a methylene group through carbon atom 5 of the pyrimidine ring and the nitrogen atom of the thiazole ring, be designated as "B_1", and that the term "B" without a subscript be no longer used.
>
> 2. That the compound identified as "6, 7 dimethyl-9 (d l'ribityl) isoalloxazine" be designated as "riboflavin", and that the terms "vitamin B_2" or "vitamin G" be no longer used.
>
> 3. That the term "pellagra-preventive factor" or "P-P factor" be used to designate the nutritional factor effective in the prevention of human pellagra. The use of the term "pellagra" shall be restricted to pellagra in man and shall not be used, even though qualified, in referring to similar syndromes in other animals.

Subsequently the Council on Pharmacy and Chemistry of the American Medical Association submitted to the two above-mentioned organizations the term "thiamin" as the acceptable designation for vitamin B_1.

Recent work indicates that there is no nerve degeneration in the uncomplicated, experimentally-produced B_1 deficiency. This vitamin is concerned primarily with carbohydrate metabolism. Hence, terms referring to the direct relation of this vitamin to nerve lesions may well be abandoned. In the January 1939 issue of this JOURNAL, Elvehjem says: "Personally I feel the use of the term, thiamin, is preferable to that of antineuritic vitamin. . . . The use of the term thiamin is consistent with attempts to relate the name of a vitamin to the chemistry of the compound involved." Consistent use of the term thiamin will lead ultimately to the removal from the literature of the more cumbersome terms, antineuritic vitamin, antiberiberi vitamin, vitamin B, etc.

The literature on the thiamin unitage and requirements is confusing. The most recent pronouncement regarding the value of an international unit is that it is the equivalent of 3.333 micrograms (3.333 millionths of one gram) of thiamin.

A number of factors may operate in determining the amount of thiamin that

[1] Received for publication February 28, 1939.

should be in the diet in order to satisfy the body's needs. Some of these are (a) the absorptive status of the gastro-intestinal tract, (b) the degree of thyroid activity and (c) the amount and quality of the fat in the diet. Owing to the apparent lack of ability for storage of thiamin in the body and in view of its rapid loss from the tissues during short periods of deficiency, it would seem that optimum nutrition, with respect to this factor, cannot be maintained unless the diet regularly contains it in adequate amounts. Considering, too, that there is no good criterion for detecting borderline degrees of thiamin deficiency, it is presumptuous to discuss with certainty thiamin requirements in terms of absolute units. Suffice it to say that the minimum daily requirement is not less than 50 I. U. for infants and 200 I. U. for the *average* adult. Intakes of 400 to 500 I.U. may be regarded as liberal for the adult. Since there is no reason to believe that this vitamin is injurious unless ingested in amounts far beyond the range of probability, it would be a safe practice to have as a goal a daily intake of at least 400 to 500 I. U. or approximately 1 to 2 mg. of thiamin.

The second suggestion made by the Committee on Vitamin Nomenclature concerned the use of the term "riboflavin" instead of the terms "vitamin B_2" or "vitamin G." Elvehjem states: "It was soon recognized that the main deficiency in the Bourquin-Sherman diet was flavin but further work has shown that this diet does not allow normal growth in rats when supplemented with adequate amounts of pure riboflavin." Hence the fallacy of continuing the use of the terms B_2 or G interchangeably with riboflavin.

Sebrell (1) has recently demonstrated the production in man of lesions related specifically to riboflavin deficiency. Previous work on animals showed that deficiency of riboflavin resulted in retardation of growth, nerve degeneration and production of cataracts. No accurate riboflavin requirement has been established for man and the flavin content of but few foods has been determined.

A flavin requirement of 1 to 2 mg. per day has been suggested, but acceptance of such a standard is not practical without more data on the flavin content of foods and more extensive experimentation. As yet no international unitage has been established for riboflavin.

The need of the human being for nicotinic acid and the effect of this substance in the alleviation of many of the symptoms of pellagra have been amply demonstrated. The human requirement has not been definitely established but the figure is probably between 10 and 25 mg. per day according to Elvehjem. Here, as in the case of riboflavin, but few data exist on the distribution of nicotinic acid in foods. Sebrell (2) has prepared a table including a limited number of foods. As yet no international unit has been suggested for nicotinic acid.

Regarding the significance to man of the other constituents of the erstwhile G complex, little can definitely be said. Establishment of their chemical structure, natural distribution, methods of assay, animal experimentation and clinical tests are all necessary before the rôle of these substances can be established in human nutrition.

There has been some confusion regarding the nomenclature of vitamin C. Originally the factor that prevents scurvy was designated as the *antiscor-*

butic vitamin. In time the term *vitamin C* was more generally used. In 1933 Szent-Györgyi and Haworth named the substance *ascorbic acid*. This designation met with general approval among chemists, both here and abroad, but owing to its therapeutic suggestiveness the American Medical Association sought a name without that objectionable connotation. The Council on Pharmacy and Chemistry of the American Medical Association adopted a new designation, *cevitamic acid*, and attempted to gain its general acceptance but the effort failed. Recently the Council abandoned the new name. For the sake of simplification in vitamin designation it is to be hoped that the term, ascorbic acid, will gradually supersede all others, since it has been generally employed by chemists from the time it was originated in 1933.

The international unit is 0.05 mg. of l-ascorbic acid. Adequate evaluations of ascorbic acid requirements are dependent upon objective methods of determining the health status in relation to ascorbic acid ingestion. In conditions accompanied by fever and infection or after subsistence on a diet low in ascorbic acid, much greater amounts of this substance are necessary to saturate the tissues than are required for the healthy, optimally-fed adult. Defects in the determination of either the health status or the amount of ascorbic acid ingested make it difficult to state with finality the requirement for this substance. However, on the basis of existing data it is justifiable to state that 1 mg. per kg. of ideal body weight is sufficient to maintain good health. In terms of international units this represents 20 I. U. per kg. of ideal body weight. For weights within the range of 50 to 70 kg. (112–154 lb.) this represents 1000 to 1400 I. U. or 50 to 70 mg. of ascorbic acid per day.

In 1922 McCollum and associates designated the substance in cod liver oil which possesses antiricketic properties, "vitamin D." In recent years investigators have shown that the properties of vitamin D are exhibited by at least eleven different sterol derivatives. The two considered to be of most practical significance are D_2 and D_3. D_2 is usually referred to as calciferol. It is formed when ergosterol (found in large amounts in mushrooms, fungi, yeast and ergot) is subjected to ultraviolet irradiation. D_3 is of animal origin. It is formed by the irradiation of 7 dehydroxycholesterol. It is due chiefly to the presence of this form of vitamin D that fish liver oils owe their antiricketic potency. The evidence at present available is indicative that, unit for unit, the various forms of vitamin D have equal value for man.

The international unit of vitamin D is defined as follows: "The vitamin D activity of 1 mg. of the International Standard Solution of irradiated ergosterol found equal to 0.025 microgram of crystalline vitamin D (calciferol)."

Vitamin D is needed throughout life, the requirement being greatest during infancy and during pregnancy and lactation. The medical consensus is that feeding vitamin D in amounts well above the minimum levels necessary for prevention or cure of rickets has no deleterious effect, and that the rule should be to give it in ample quantity to cover any possible unrecognized requirement. For the infant, 400 to 800 international units daily are usually prescribed for prophylaxis. The therapeutic dose is generally regarded as 1000 to 1500 international

units per day. There is a paucity of data on the vitamin D needs of adults. In the case of pregnant and lactating women the League of Nations Health Committee recommends a minimum daily intake of 340 international units. This intake would hardly be considered excessive for the average normal adult.

The U. S. Pharmacopeia defines standard cod liver oil as that containing 600 I. U. of vitamin A and 85 I. U. of vitamin D per gram. Most pharmaceutical houses prepare oils of a greater potency. The dosage prescribed depends quite naturally upon the A and D unitage of the particular product employed.

The significance of vitamin E in human nutrition is still in doubt and largely speculative. Several clinical reports have appeared which suggest that wheat germ oil (a rich source of vitamin E) is of value in preventing spontaneous human abortions. Much of the data is unconvincing because of the lack of adequate control. There is no very satisfactory method of vitamin E assay and no acceptable unit has been established.

In this discussion I have attempted only to call attention to the desirability of adopting the practice of designating the vitamins by the terms advocated by the American Society of Biological Chemists and the American Institute of Nutrition. It seemed timely, too, in speaking of these dietary essentials, to define again the unit of each as accepted by the U. S. Pharmacopeia and to call attention to the human requirements for each.

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A STUDY OF THE DIETS OF ONE HUNDRED COLLEGE WOMEN STUDENTS[1]

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THE problem of human dietary requirements has been a consideration of research investigation for more than a quarter of a century. In recent years subnutrition has been recognized as a major contributing cause of the poor physical status of a large part of the human race. The attention of biochemists has been turned from the "minimum requirement" for dietary essentials to a consideration of "standard allowances" adequate to meet an optimal state of human nutrition. Studies based on spontaneous consumption of food, statistics of food production and reports of importation-exportation of produce from certain centers, animal experimentation, and calorimeter or balance studies with human beings, are the agents by which investigators have tried to establish requirement levels of nutrient intake for the various age groups. Standardization, however, for nutrient requirements is difficult at present because of changing knowledge, inadequacy of present measures of standards, lack of means for detection of moderate and mild deficiencies, and the great variability among human beings. Nutritional standards, according to Atwater,[2] are at best "only an indication, not a rule." They find their best use as guides in the interpretation of dietary studies.

For the past three years students in beginning courses in nutrition at the Utah State Agricultural College have been required to keep a food consumption record for a period of one week during the course. Quantities of food consumed were estimated in terms of cupfuls or tablespoonfuls, while bread, meat portions, etc. were measured with rulers. This was done mainly to make students aware of the requirements of good nutrition. Out of five hundred such records, one hundred, showing evidence of having been carefully prepared, were selected for comparison with accepted standards of good nutrition. Table 1 shows the standards used for this comparison.

Since students are not required to live in dormitories at this institution it was thought desirable to compare food intake on the basis of living conditions. Accordingly, records were grouped under the headings: home living, boarding, bachelor quarters, and dormitory.

The mean intake over a seven-day period together with the probable error was calculated for individual nutrients in each of the four groups (table 2). Variability in nutrient intake is shown by values of the coefficient of variability in table 4.

A second analysis of the dietaries was made to determine the frequency with which various protective foods appear in the diets of the college women. A count was also taken on the number of candy bars eaten per week. The mean number of servings per week was determined for each nutrient in the dietaries of all four groups and their relationships noted (table 5).

As shown in table 2, the groups as a

[1] Received for publication October 10, 1938.

[2] Quoted by Sherman, H. C.: Chemistry of Food and Nutrition, 5th ed., p. 504.

whole have a mean energy intake lower than the established standard for the group. The protein, on the basis of 1 gm. per kg. of normal body weight, is slightly higher than the standard. The calcium intake is above the 0.68 gm. level and the phosphorus intake below the 1.32 gm. standard. The mean iron intake of the entire group is slightly above Sherman's (2) suggested maintenance requirement of 8 mg., thus indicating a general tendency toward border-line deficiency in this dietary constituent. The vitamin A intake is found to be above the accepted 6250 I.U. level, but the mean intake for both vitamin B_1 and for ascorbic acid is below the standards established for this study.

Tables 2 and 3 show the relative standing of the different groups with reference to their intake of various nutrients. In table 2 the mean intake of the dormitory group is shown to be consistently higher than that of the other groups. This appears also in the relative ranking of the groups shown in table 3 where the dormitory group is found to have a rank of either 1 or 2 with reference to all nutrients. The mean intake of students living at home is consistently lower as

TABLE 1

Standards of nutritional requirements used in this study

FOOD PRINCIPLE	DAILY REQUIREMENT (ADULT)	AUTHORITY
Energy (calories)	40 calories per kg. of normal body wt.	Rose (1)
Protein	1 gm. per kg. of body weight	Sherman (2)
Minerals:		
Calcium	0.68 gm.	" "
Phosphorus	1.32 gm.	" "
Iron	12.0 mg.	" "
Vitamins:		
A	6250 I.U.	Daniel and Munsell (3)
B_1	200 I.U.	" " "
Ascorbic acid	60 mg.	" " "

TABLE 2

*Comparison of mean nutrients in diets of college women living under four different conditions**

MANNER OF LIVING	NUMBER OF CASES	MEAN							
			Gm.			Mg.	International units		Mg.
		Calories	Protein	Calcium	Phosphorus	Iron	Vitamin A	Vitamin B_1	Ascorbic acid
Whole group	100	1805±44.5	60.71±1.71	0.717±.036	1.103±.053	8.86±.23	7793± 575.13	121.72± 8.58	44.7±2.97
Home	19	1714±46.87	58.18±2.6	0.693±.039	1.04 ±.046	8.54±.29	8000± 824.1	125.8 ±10.8	40.4±2.89
Boarding	32	1776±39.5	62.11±1.46	0.733±.043	1.07 ±.046	8.56±.238	7498± 380.7	110.3 ± 5.37	32.2±2.86
Bachelor qtrs.	34	1823±38.12	60.7 ±1.45	0.706±.023	1.12 ±.042	8.83±.302	6964± 456.07	128.2 ± 9.98	60.0±2.97
Dormitory	15	1938±65.33	60.9 ±2.079	0.736±.0417	1.20 ±.073	9.94±.395	10034±1032.5	125.9 ± 6.66	42.2±2.16
Standard		2245	56.18	0.680	1.32	12.00	6250	200.0	60.0

* References used for calculations: Bradley, *Tables of Food Values* (4), Daniel and Munsell, *Vitamin Content of Foods* (3), Rose, *Laboratory Handbook for Dietetics* (5).

shown by a relative ranking of 4 in all nutrients except the vitamins. The mean intake of the students boarding and of those living in bachelor quarters is roughly comparable as seen by the nutrient means in table 2 and the relative ranking in table 3. Considering the trend of nutrient adequacy of the four groups as shown by the means with variability in the energy and protein portions. It is also noted from table 4 that the students living in bachelor quarters show, on the whole, slightly less variability in dietary nutrients than do those of the other groups, although the differences are not strongly marked.

A better acquaintance with the dietaries in the groups studied may be had by

TABLE 3

Relative ranking for mean nutrient intake in diets of college students living under four different conditions

MANNER OF LIVING	NUMBER OF CASES	RANK							
		Energy (Calories)	Protein	Calcium	Phosphorus	Iron	Vit. A	Vit. B_1	Ascorbic acid
Home	19	4	4	4	4	4	2	3	3
Boarding	32	3	1	2	3	3	3	4	4
Bachelor quarters	34	2	3	3	2	2	4	1	1
Dormitory	15	1	2	1	1	1	1	2	2

TABLE 4

Coefficients of variation in the nutrients making up the diets of college students living under four different conditions*

MANNER OF LIVING	NUMBER OF CASES	COEFFICIENTS							
		Calories	Protein	Calcium	Phosphorus	Iron	Vit. A	Vit. B_1	Ascorbic acid
Home	19	17.79	29.04	36.50	27.88	22.48	67.1	55.96	46.53
Boarding	32	18.80	19.90	49.65	35.94	23.55	42.89	41.16	75.03
Bachelor quarters	34	18.20	10.92	28.61	32.76	29.78	56.99	68.09	43.00
Dormitory	15	19.47	19.72	32.76	36.25	22.93	76.55	30.57	29.62

* Formula: $V = \frac{\sigma}{m} \times 100$.

their probable error given in table 2, there is indication of better meal planning in the organized institutions.

The nature of the variation within nutrient groups and the relative variation between the groups are indicated by values of the coefficients of variation as shown in table 4. As will be noted, the greatest variability is found in the vitamin portions of the diet and the least

referring to table 5. This table shows the average number of times various foods were served during one week to the student groups as compared with the number of times recommended by Chaney and Ahlborn (6). Observation of the actual number of servings per week of various foods as seen in table 5 shows the mean intake of milk for those living at home to be 4.23 pints as compared

with 3.46 pints for dormitory students, 3.0 pints for students boarding, and 2.8 pints for students in bachelor quarters. The group living at home consumed more whole grain cereals than did the other groups, but the students living in bachelor quarters included more fruits, both cooked and raw, in their diets. Their consumption of cooked vegetables, other than potatoes, and of raw vegetables was second only to the dormitory group, but their milk intake was the lowest of the four groups. More meat was eaten by those boarding in homes and pork[2] was served more often to this group. Students living in dormitories, however, were served liver more frequently and included eggs in their diets more times per week.

From table 5 it is interesting to note that the students with the lowest calorie intake, those living in homes, consumed the largest number of candy bars. However, most of the candy consumed by this group was eaten by 2 of the 19 students.

TABLE 5

Frequency with which various foods occur in the college students' dietaries (number of servings per week)

FOODS	REQUIRED NUMBER OF SERVINGS*	NUMBER OF SERVINGS PER WEEK				
		Whole group	Home	Boarding	Bachelor quarters	Dormitory
Milk, pints	7	3.25	4.23	3.00	2.81	3.46
Vegetables:						
Potatoes	7	3.65	4.89	2.15	3.79	4.93
Other, cooked	7	5.83	5.68	5.62	5.73	6.66
Raw, or tomatoes	7	3.24	2.94	2.65	3.64	3.93
Fruits:						
Cooked	7	4.24	3.89	2.31	5.55	5.80
Raw	7	3.51	3.63	3.65	3.70	2.66
Whole grain cereals	14	2.75	3.52	3.34	2.14	1.86
Meat, eggs, cheese	14	8.35	9.15	10.43	4.73	11.06
Candy bars		0.90	1.32	0.50	1.13	0.73

* Based on Food Selection Score-Card (Reference 3, page 16).

SUMMARY

A study was made of one week's dietary for 100 Utah State Agricultural College women students. These students were classified into the following residence groups: home, boarding, bachelor quarters, and dormitories.

Standards of comparison were developed for this study from recommendations proposed by Sherman, Rose, and Daniel and Munsell.

It was found that the diets of all groups were generally lower than the standards used for comparison. The dietaries of those living in dormitories were consistently superior both in quan-

[2] In estimating vitamin B_1, pork consumed was not taken into consideration. Information concerning the value of pork as a source of vitamin B_1 was not available at the time this paper was written.

tity and quality, while the dietaries of those living in homes were the poorest in both respects. The differences between all groups, however, were not great.

Dietary records of all groups showed consistent deficiencies in phosphorus, iron, vitamin B_1, and ascorbic acid.

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THE INFLUENCE OF PASTEURIZATION ON THE ASCORBIC ACID (VITAMIN C) CONTENT OF CERTIFIED MILK[1]

ARTHUR D. HOLMES AND FRANCIS TRIPP;[2] ELMER A. WOELFFER;[3] AND G. HOWARD SATTERFIELD[4]

THERE is evidence that commercial pasteurization has destructive action on the ascorbic acid of cow's milk. Part of this loss is attributable to the kind of metal used in the pasteurizing equipment, the presence of copper in the milk from whatever source being highly unfavorable.

Conn, Johnson, Trebler, and Karpenko (1) found from careful analyses that pasteurized milk may contain slightly more copper than raw milk. Tauber (2) stated that the partial destruction of vitamin C in cow's milk was due to traces of copper introduced by feeding or by mechanical means. Schwartze, Murphy, and Cox (3) showed that 80 to 90 per cent of vitamin C was lost when milk was pasteurized in copper containers, and only 20 to 40 per cent when pasteurized in aluminum containers. They obtained intermediary results with tinned copper containers. In a study of 355 milk samples, Sharp (4) reported, "If milk has not been contaminated with copper, pasteurization by the holder method in glass, aluminum or chromium steel containers will not accelerate appreciably the rate of destruction of ascorbic acid."

King and Waugh (5) found considerable loss in the ascorbic acid content of cow's milk pasteurized by the holder method but no appreciable destruction by the Electropure or Stam Vik methods. Riddell and Whitnah (6) likewise found that in stainless steel equipment the flash method caused but slight reduction in vitamin C. Kon and Watson (7) reported that pasteurization by the holder method in aluminum vessels destroyed the reversible oxidized form but not the reduced form of ascorbic acid in cow's milk.

Whitnah, Riddell and Caulfield (8) checked five holder type pasteurizers and noted excessive losses of ascorbic acid. In the same study with short-time pasteurization by high temperature pasteurizers they found no destruction of ascorbic acid.

Reedman (9) observed that milk pasteurized 30 minutes by the holder method retained about 75 per cent of the original vitamin C, the highest destruction being 26.5 per cent.

Olson and Copeland (10) found that pasteurization in closed bottles at 142°F. for 30 minutes decreased the vitamin C content of cow's milk.

Hand, Guthrie and Sharp (11) observed that milk pasteurized by the holder method is more susceptible to oxidative changes than raw milk, although pasteurization exerts little accelerating action on the oxidation of the reduced form of vitamin C. Apparently some pasteurized milk may have a low vitamin C content for Ingalls (12) found from a random, nine-day sampling of commercially pasteurized milk that the

[1] Received for publication January 29, 1939.

[2] Research Laboratories, The E. L. Patch Company, Boston. Work contributed to this study by Francis Tripp was submitted in partial fulfilment of the requirements for the degree of Master of Science, University of North Carolina.

[3] H. P. Hood and Sons, Boston.

[4] University of North Carolina, Raleigh.

vitamin C content was less than .001 mg. per cc. and that the vitamin C content of human milk decreased from .026 mg. to .003 mg. per cc. during pasteurization, and subsequent storage and delivery to the hospital ward. On the other hand West and Wenger (13) who assayed 720 samples of certified milk produced by 108 cows found that when the raw certified milk was 34 hours old the average minimum vitamin C content was 13.1 mg. per quart for Holstein milk and 14.2 mg. per quart for Guernsey milk. This observation is substantiated by Whitnah and Riddell (14) who concluded that fresh milk may be an important source of vitamin C and "that much of this vitamin C content can, with proper precautions, be conserved satisfactorily either in raw milk or in milk that has been pasteurized by the flash method."

To obtain more data concerning the vitamin C content of certified milk, an extended study of 18 months duration was made under carefully controlled conditions to determine the ascorbic acid content of certified milk before and after pasteurization.

EXPERIMENTAL

The milk used in this study was obtained from a mixed herd of Guernsey, Holstein and Ayrshire cows maintained on a certified milk farm in Massachusetts. The ages of the cows varied from 3 to 11 years and practically all stages of lactation were represented in the herd. The cows' rations consisted of various combinations of the following ingredients: first and second grades of mixed hay, first and second grades of alfalfa hay, beet pulp, dairy ration, dairy ration with 6.7 per cent irradiated yeast, home mixed fitting ration with 6.7 per cent irradiated yeast and a commercial fitting ration with 6.7 per cent irradiated yeast. (The composition and ascorbic acid content of the dairy and the fitting rations are reported in tables 1 and 2).

TABLE 1

Composition of Dairy and Fitting Rations

	Per cent
Dairy Ration	
Wheat bran	25.0
Oats (crimped)	17.5
Yellow hominy feed	10.0
Distillers' corn grains dried	10.0
Corn gluten feed	10.0
Cottonseed meal—41% (hydrolytic process 5% fat)	10.0
Yellow corn meal	5.0
Soy bean oil meal (expeller process)	5.0
Cane molasses	5.0
Iodized salt	1.0
Steamed bone meal	1.0
Calcium carbonate	0.5
Home Mixed Filling Ration	
Oats (crimped)	30.0
Wheat bran	25.0
Yellow hominy feed	15.0
Yellow corn meal	10.0
Soy bean oil meal (expeller process)	10.0
Cane molasses	7.0
Steamed bone meal	1.0
Calcium carbonate	1.0
Iodized salt	1.0
Commercial Filling Ration	
Corn meal	Unknown
Corn gluten meal	"
Crushed oats	"
Soy bean oil meal	"
Wheat middlings	"
Wheat bran	"
Alfalfa meal	"
Dried beet pulp	"
Molasses	"
Calcium carbonate	"
Iodized salt	"
Carotene	"

The cows were milked by machines at 3:30 a.m. and p.m. The milk was drawn into aluminum pails, passed through a small container fitted with a cloth filter, and then into stainless steel spray holding vats of 300 gal. capacity. The afternoon's milk was promptly cooled below 50°F. for holding in the vats until the morning's supply was available for mixing and pasteurizing with it. The samples taken for analysis consisted therefore of half morning's and half afternoon's milk and represented a composite milk from 110 Guernsey, 57 Holstein and 8 Ayrshire cows.

TABLE 2

The Ascorbic Acid Content of the Components of the Experimental Ration

	ASCORBIC ACID PER 100 GM. OF FEED
	mg.
Good farm hay (one-half alfalfa)	1.334
2nd grade farm hay (all grass)	0.907
Grass ensilage	1.548
1st grade baled alfalfa	1.883
2nd grade baled alfalfa	1.380
Beet pulp	0.669
Milking ration	0.562
Milking ration with irradiated yeast	0.754
Fitting ration and irradiated yeast	0.592
Commercial fitting ration with irradiated yeast	1.622

The milk was pasteurized in a 300 gal. stainless steel commercial spray vat equipped with stainless steel agitators which kept the milk gently in motion during the holding period. The heat for pasteurization was supplied by hot water circulated through a jacket which surrounded the holding chamber. The air space above the level of the milk in the holding chamber was also heated to 143°F. during pasteurization.

About 30 minutes were required to bring the milk to a temperature of 143°F. at which it was then held for slightly over 30 minutes and then pumped from the pasteurizer through stainless steel pipes over a cabinet cooler which brought the temperature down to 42°F.

Samples of raw and pasteurized milk collected immediately before and after pasteurization were taken at bimonthly intervals throughout an experimental period of 18 months. The milk was collected in one ounce flint glass bottles which were immediately placed on ice. The samples were protected from light until they were assayed since Riddell and Whitnah (6) had found that exposure of milk to sunlight caused extensive destruction of vitamin C. All assays were completed within 12 hours after pasteurization.

The ascorbic acid content of the milk was determined by the indophenol titration method. Details for the preparation of the reagent solutions and the procedure may be found in papers by Tripp, Satterfield and Holmes (15) and by Holmes, Tripp, Woelffer and Satterfield (16).

RESULTS

The ascorbic acid content of the samples of pooled raw milk and samples of the same milk after pasteurization is shown in table 3. An examination of these data shows variations in the ascorbic acid content of raw and pasteurized milk, and also reveals variable losses from pasteurization. The amount of ascorbic acid per liter in the raw milk ranged from 14.12 mg. on September 15, 1938, to 21.89 mg. on January 20 with an average for the 18 months of

17.26 mg. In other words, the maximum amount of ascorbic acid found in the raw milk (on January 20) was one and one-half times the minimum amount (on September 15).

TABLE 3

The Ascorbic Acid Content of Cow's Milk Before and After Pasteurization

DATE	ASCORBIC ACID CONTENT PER LITER		LOSS IN ASCORBIC ACID PER LITER	LOSS IN ASCORBIC ACID
	Unpasteurized milk	Pasteurized milk		
	mg.	*mg.*	*mg.*	*per cent*
Aug. 19	16.17	9.56	6.61	40.88
Sept. 16	17.24	15.63	1.61	9.34
Sept. 30	17.33	14.44	2.89	16.68
Oct. 14	16.48	14.51	1.97	11.96
Oct. 28	18.96	16.35	2.61	13.76
Nov. 10	16.35	14.95	1.40	8.56
Nov. 24	18.25	16.62	1.63	8.94
Dec. 9	19.86	14.98	4.88	24.58
Dec. 23	15.60	13.64	1.96	12.56
Jan. 6	17.54	14.94	2.60	14.82
Jan. 20	21.89	18.98	2.91	13.29
Feb. 3	18.63	17.57	1.06	5.69
Feb. 17	17.85	13.70	4.15	23.50
Mar. 3	16.78	16.02	0.76	4.53
Mar. 23	16.10	13.03	3.07	19.06
Apr. 7	18.56	14.85	3.71	20.00
Apr. 21	14.76	13.45	1.31	8.88
May 6	16.06	13.97	2.09	13.02
May 19	16.02	14.35	1.67	10.42
June 2	16.22	13.12	3.10	19.11
June 23	16.45	13.03	3.42	20.79
July 8	15.85	10.78	5.07	31.99
July 21	15.50	9.74	5.76	37.32
Aug. 11	16.68	7.80	8.88	53.25
Aug. 26	17.28	12.00	5.28	30.55
Sept. 15	14.12	11.66	2.46	17.43
Oct. 4	19.27	14.18	5.09	26.41
Oct. 27	18.65	16.48	2.17	11.64
Nov. 30	19.46	16.64	2.82	14.50
Jan. 5	17.82	13.81	4.01	22.56
Averages	17.26	14.03	3.23	18.71

The ascorbic acid content per liter of the pasteurized milk varied from 7.80 mg. on August 11, 1938 to 18.98 mg. on January 20 with an average of 14.03 mg. for the entire period. Variations in the ascorbic acid content of the pasteurized milk were considerably greater than in the raw milk (chart 1); the maximum was nearly two and one-half times as great as the minimum. On March 3 the loss of ascorbic acid in the pasteurized milk was 0.76 mg. per liter, and on August 11, 1938 this loss was 8.88 mg. although the raw milks on these dates contained approximately the same amounts of ascorbic acid (16.78 and 16.68 mg. respectively). In fact it will be noted that the greatest losses of ascorbic acid during the pasteurization process did not occur in the raw milks having the highest ascorbic acid content. On a percentage basis the loss of ascorbic acid varied from 4.53 per cent in March to 53.25 per cent in August, 1938. The second largest percentage loss of ascorbic acid, 40.88 per cent, occurred in August, 1937. Other large losses of ascorbic acid during pasteurization were 37.32 per cent on July 21, 1938, 31.99 per cent on July 8, 1938 and 30.55 per cent on August 26, 1938. It is of interest that all of these excessive losses occurred during the hot sultry days of late summer whereas very much smaller losses occurred during the cooler seasons of the year.

The results obtained in this study of the ascorbic acid content of pasteurized certified milk are in agreement with the losses of 10.0 to 20.0 mg. per liter reported by Dann and Satterfield (17). On the other hand the average content of 14.03 mg. per liter for pasteurized milk over the 18 months period is considerably greater than the average of 9.0 mg. per liter obtained by Hawley (18)

at Rochester, New York, from a study of May and June pasteurized milk. Without data concerning the pasteurizing equipment used in the Rochester experiment, an explanation of the loss of nearly 50 per cent of ascorbic acid cannot be ventured.

The raw certified milk was found to contain from 14.12 to 21.89 mg. or an average of 17.26 mg. of ascorbic acid per liter.

The pasteurized milk was found to contain from 7.80 to 18.98 mg. of ascorbic acid with an average of 14.03 mg.

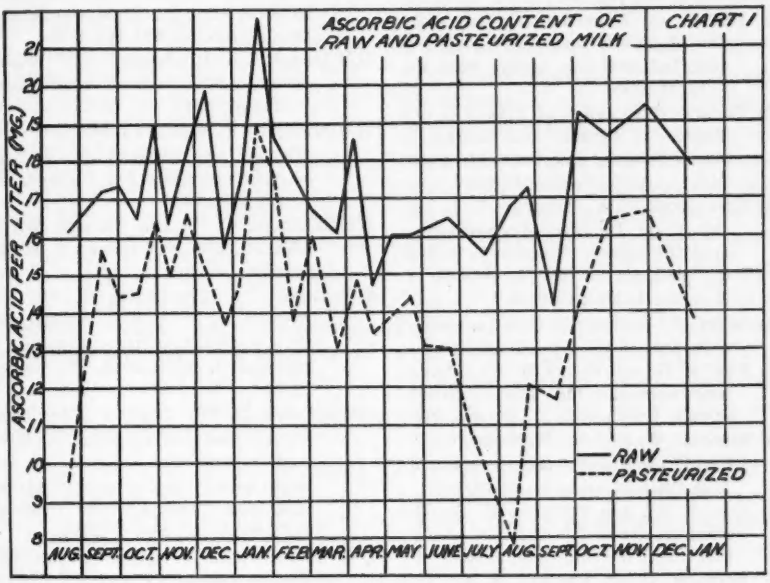

CHART 1

SUMMARY

A study was made of the ascorbic acid content of certified milk produced by a mixed herd of 175 Guernsey, Holstein and Ayrshire cows during an 18 months period.

At bimonthly intervals samples were taken of the pooled milk from the entire day's production. Determinations of the ascorbic acid content were made by the indophenol method before and after pasteurization for 30 minutes at 143°F. in stainless steel spray vats.

per liter. The loss of ascorbic acid by the pasteurization process was greater in the warm, and less in the cooler seasons. The greatest loss was in August 1938 (53.25 per cent) and the least in March (4.53 per cent).

The average loss of ascorbic acid from pasteurization was 18.71 per cent for the 18 months period.

The results of this study show that a generous consumption of either raw or pasteurized milk, produced under ideal conditions, can contribute significant amounts of vitamin C to the daily diet.

ACKNOWLEDGMENT

The authors wish to acknowledge the very helpful assistance of Mr. A. A. Colley and Mr. E. C. Steele during the course of this study.

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SANITATION SCORE-CARDS FOR SCHOOL LUNCHROOMS[1]

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IN AN effort to increase the efficiency of the school lunchrooms of Rochester and to perfect sanitary standards, a committee of six lunchroom managers was appointed by the director of the city's school lunchrooms to study local conditions and to prepare a simple, specific schedule of daily and weekly sanitary practices.

From the outset it was the desire of the committee to avoid generalities and to prepare a simple and clear statement of basic sanitary principles in terms of practical lunchroom routine. The committee divided itself into four groups. One member presented data from one or two current publications devoted to public health which stressed the serious need of elimination of unsanitary conditions and practices in public eating places where food and drink are served. Two prepared a detailed statement of the daily and weekly care of kitchen equipment such as potato peeler, soup kettle, vegetable steamer, mixing and chopping machines, ranges, and refrigerators, as well as the proper care of steam tables, milk bottles, towels, and floors. Two others presented a practical statement of the essential steps in dish washing. The sixth member of the committee faced the problem of roach, fly, and rodent prevention, and outlined practical measures for the elimination of each of these pests.

This beginning suggested the desirability of a score-card, simple and complete enough to be used in the school lunchrooms of Rochester as an aid to each manager in raising sanitary standards. Inquiry was made of the Bureau of Health in Rochester, the Health Department of the State of New York, and federal agencies. The committee found that various cities of the country have several types of cards for the scoring of restaurants, hotels, and cafes, but that most of these commercial score-cards concern items not so pertinent to the lunchroom and fail to treat with sufficient helpful detail the items of most importance in school lunchroom work. In addition, a numerical system of scoring is generally used and the committee felt this to be both cumbersome and impractical for their purposes. Eventually, through Mr. George A. West of the Rochester Health Bureau (whose courtesy and cooperation we wish to acknowledge), the committee obtained a card issued by the Health Department of the District of Columbia. This card proved to be more specific than others studied and included a number of useful suggestions, although here, too, the numerical system of scoring was employed.

Study of the items to be scored soon convinced the committee that in the Rochester school lunchrooms there were two groups of factors to be considered: first, those under the direct control of the lunchroom manager; and, second, those such as floor drainage, wall material, lighting, ventilation, and other phases of the physical set-up which are normally the concern of other departments of the

[1] Presented at the Conference of Food Service Directors, Rochester, New York, November 5, 1938.

school system. For our score-cards, therefore, two columns were needed. The first column listed items not under the direct control of the lunchroom management but still very important if sanitary conditions are to be achieved. The second listed items which are directly controlled by the lunchroom. A sample of the card as developed to date is included.

SANITATION SCORE-CARD

Name of School.....
Date.....

Black—Good.....
Red—Poor.....Manager.....
Member of Sanitation Comm.....

Conditions not controlled by lunchroom	*Conditions controlled by lunchroom*
I. Sanitary Conditions of Kitchen	
A. Floors	A. Floors
.....1. Composition and construction	.....1. Sweeping when necessary
.....2. Proper drainage	.....2. Damp mopping before lunch
.....3. In good repair	.....3. Thorough mopping daily
	.....4. Unprotected food and other articles stored off floor
B. Walls and ceilings	B. Walls and ceilings
.....1. Light colored	.....1. Free from dirt
.....2. Smooth, washable material	
.....3. In good repair	
C. Lighting	C. Lighting
.....1. Evenly distributed	.....1. Clean globes and fixtures
.....2. Adequate	.....2. Bulbs replaced
D. Ventilation	D. Ventilation
.....1. All stoves and ovens should be provided with ventilator, hoods, and pipes	.....1. System properly operated
.....2. Mechanical ventilation	.....2. Fans clean
.....3. Outside	
E. Doors and windows	E. Doors and windows
.....1. Properly screened	.....1. Clean
.....a. Doors open in and out	
.....2. Self-closing	.....2. In good repair
	.....3. a. even—b. good repair
F. Water supply	F. Water supply
.....1. Adequate running hot and cold water	.....1. Suitable sinks
	.....2. Adequate drains
	.....3. Plumbing in good repair
G. Lavatory and toilet facilities	G. Lavatory and toilet facilities
.....1. Conveniently located	.....1. Orderliness
.....2. Properly constructed	.....2. Cleanliness of room
.....3. Provided with equipment	.....3. Lavatory clean
.....4. Convenient and adequate lavatory facilities for students	.....4. Mirror clean
	.....5. Adequate lockers (metallic)
	.....6. Provided with soap and paper supplies
H. Pests	H. Pests: spraying at regular intervals
	.....1. Flies
	.....2. Roaches
	.....3. Rodents

Conditions not controlled by lunchroom	*Conditions controlled by lunchroom*
II. Sanitary Conditions of Lunchroom	
A. Floors	A. Floors
.....1. Composition and construction	
.....2. In good repair	
.....3. Removal of refuse on floor during lunch period	
.....4. Sufficient number of waste-baskets	
B. Walls and ceilings	B. Walls and ceilings
.....1. Light colored	
.....2. In good repair	
.....3. Globes and fixtures clean	
C. Lighting	C. Lighting
.....1. Evenly distributed	.....1. Bulbs replaced
.....2. Adequate	
D. Ventilation	D. Ventilation
.....1. Adequate	.....1. Properly aired
E. Doors and windows	E. Doors and windows
.....1. Doors open out	
	F. Tables and chairs
	.....1. Brushed
	.....2. Chairs in place
	.....3. Tables in line
	G. General orderliness of room
III. Construction and Cleanliness of Utensils and Equipment	
.....A. Adequate	A. Potato peeler
	.....1. Thoroughly cleaned immediately after use
.....B. Properly constructed and easily cleaned material	.....B. Soup kettle
	.....1. Clean and polished
.....C. In good repair	C. Vegetable steamer
	.....1. Clean
	.....2. Dry
	D. Steam tables
	.....1. Clean
	.....2. Polished
	.....3. Orderly when in use
	E. Mixing and Chopping Machines
	.....1. Cleaned after use
	F. Ranges
	.....1. Clean
	.....2. Hoods clean
	G. Can Opener
	.....1. Cleaned and scalded daily
	.....2. Plate unscrewed and cleaned at regular intervals
	H. Aluminum
	.....1. Polished
	I. Enamelware
	.....1. Not chipped or stained
	J. Sinks and tables
	.....1. Orderly
	.....2. Clean
	.....3. Drawers clean and orderly
	K. Small Equipment
	.....1. General orderliness in placement

Conditions not controlled by lunchroom	*Conditions controlled by lunchroom*
IV. Food Storage	
.....A. Sufficient Storage Space	.....A. All perishable foods stored and kept at proper temperature
.....B. In good repair	.....B. Refrigerator
	.....1. Clean
	.....2. Free from odors
.....C. Easily cleaned	.....C. Food in refrigerator checked daily
	.....D. Food covered
	.....E. Position of foods with relation to each other
V. Storeroom	
.....A. Adequate and convenient	.....A. General orderliness
.....B. Shelving space	.....B. Cleanliness
.....1. Width and depth of shelf to accommodate specific number of cans	
.....C. Ventilation	.....C. Cans placed uniformly with labels out
.....D. Dry	.....D. All bulk food in canisters properly labeled as to content and weight of can
	.....E. Perishable foods stored in uniform containers
	.....F. Stale bread in bread boxes
VI. Dish Room	
.....A. Location	.....A. Orderly appearance of room while in use
.....B. Size of room, large	.....B. Care and cleanliness of machine
.....C. Lighting and ventilation	.....C. Stacking and scraping of dishes
	.....D. China
	.....1. Well washed
	.....2. Not chipped or cracked
	E. Glassware
	.....1. Polished
	.....2. Not chipped or cracked
	.....3. Inverted when put away
	F. Silverware
	.....1. Polished
	.....2. Not worn
	.....3. Proper placement in silver boxes
VII. Linens	
	.....A. Adequate supply
	.....B. Storage
	.....C. Cleanliness
	.....D. Containers for soiled towels
VIII. Garbage and Refuse	
.....A. Proper storage cans until removal	.....A. Metal containers
.....B. Daily removal	.....B. No leakage
.....C. Sufficient waste paper containers	.....C. Tightly covered
	.....D. Washed daily
	.....E. Proper placement
IX. Personnel	
.....A. Health examination	.....A. Proper uniforms
	.....B. Clean and neat
	.....C. No jewelry
	.....D. Suitable make-up

It was hoped that such a two-column card might prove not only a simple and usable tool to help each lunchroom manager in solving some of her problems, but that it might also eventually be a means of arousing interest and enlisting the cooperation of those not so directly concerned with lunchroom sanitation. Such a score-card would, at least, provide a tangible objective toward which each lunchroom could work.

In order to avoid a complex card, the numerical system of checking was discarded. Instead, the committee decided to use only two ratings: *good*, indicated by a black check mark; and *poor*, indicated by a red check.

After these details were worked out, the card was tested by actual use to determine whether it really was convenient and practicable. Each one of the committee met with some other member of the committee and made a test check of a lunchroom. This experience led to two or three minor changes.

At a general meeting of all lunchroom managers the score-card was given to each manager in order that she might try it out by checking her own lunchroom. All the managers were asked to comment and make suggestions. It was at this point that an unforeseen and, as it turned out, most valuable use for the score-card presented itself. Instead of checking their own lunchrooms, some managers delegated this job to certain of their lunchroom workers. Immediately a new pride in having each station measure up to standard and a keener appreciation of sanitary methods seemed to animate the force.

Finally, after a given date, one of the committee visited each lunchroom and, with the manager, officially scored that lunchroom. These scores are kept in the lunchroom, since they are designed merely as a help for each manager and not as a basis for comparison between one lunchroom and another.

Since this final scoring was done only once last year, it is planned to have the same committee serve during the coming year, scoring each lunchroom, in company with its manager, twice during the year. It is expected that subsequently a new committee will be appointed each year by the director of lunchrooms.

Of course this set-up and the score-card itself are both on trial. Experience may lead to changes in the card and a different method of procedure. It has been the intention of our committee to accomplish two things: first, to provide a practical, easy to score card; and second, to outline a simple, flexible system of check-ups which could be easily changed or adapted to varying conditions.

So far the managers of the Rochester school lunchrooms all feel that our score-card has helped to raise the standard of cleanliness and good sanitation in our respective lunchrooms, and in certain schools it has made our workers aware of what sanitation means and has given them the incentive to maintain a very high degree of cleanliness and order. Best of all, they are taking pride in their own accomplishment. While we realize that the plan may need further study, we feel that much has already been accomplished in this preliminary program.

EDITORIAL

Commercially Quick-Frozen Foods, A Modern Innovation[1]

The ingenuity of the commercial canner has been responsible for the great variety of foods made available to the public for general consumption. In food preservation canning has led the field, and today literally hundreds of varieties of foods can be purchased in the can at almost any wayside store.

Frozen foods represent the packer's latest contribution to better living. Although the freezing method of preserving fruits has been in use for many years, it is only since 1929 that freezing preservation of vegetables has assumed large proportions. The 1937 pack of frozen fruits and vegetables was 50 per cent greater than the 1936 pack. The year 1938 saw another similar increase. To date, berries have been responsible for the greatest tonnage, with peas ranking second. The total frozen pack of fruits and vegetables (including fruit juices) for 1937 was 228,417,000 pounds, which was packed in 942 plants.

There are good reasons why consumers have reacted so favorably toward frozen foods. First, frozen foods have more characteristics of the fresh product than those preserved by other methods. The fruits retain their natural flavors and aromas and can be used as any fresh fruit might be used. Further, the product is prepared so that after defrosting it is ready for use as a dessert, or a flavor and addition to ice creams or sherbets. Finally, the food components so important in the fresh material are not appreciably altered in the frozen product. To the dietitian these facts are important because she is interested not only in the freshness, succulence, and flavor, but also in the preservation of food constituents.

There are essential differences between the marketing of fresh and frozen vegetables. Fresh vegetables are harvested, packed, and shipped as quickly as possible. Extreme care is taken to see that the cars are well iced. Ice is added in transit, but sometimes it takes days before the car reaches its final destination. Then the product remains in the hands of the wholesaler or retailer for varying periods of time before it is distributed to the consumer.

Vegetables which have been harvested continue to respire, and chemical changes occur which bring about a change in flavor—particularly sweetness. For example, sweet corn loses about one-half its sugar when held for 24 hours at 86 degrees F. Peas similarly lose approximately one-third of their sugar if held for six hours at 77 degrees F. according to Kertesz. Kohman has shown that vined peas respire abnormally after being bruised in threshing. This respiration will produce off-flavors, due probably to the alcohol and acetaldehyde formed. Even though many fresh products sent to market are kept in iced refrigerators, the respiratory changes are nevertheless going on with the result that certain essential food constituents may be partially lost or changed.

It has been demonstrated that products which have been frozen retain certain essential food compounds usually

[1] Abstract of an address by E. H. Wiegand and Thomas Onsdorff, Food Products Industries, Oregon Agricultural Experiment Station, Corvallis, Oregon, before the annual meeting of the Northwest Dietitians, Portland, April 22, 1938.

lost by the fresh marketing methods. The reason for this is obvious, for the product is handled expeditiously from the field to the freezer. In products like fruits that require no pre-treatment other than washing and packing, the process is so simple that little time elapses before they are actually frozen and deterioration processes that cause loss in food constituents are stopped. In vegetables, transpiration and oxidation are checked by first blanching the products and then packing and freezing.

Oxidation causes flavor and color changes. It is stimulated by light and heat and may be checked by cold and blanching. There are other handling practices used in preparing fruit and vegetables for freezing which check these processes. Fruits are promptly coated with sugar and also syrup. With vegetables, blanching is the most effective treatment used to stop oxidation and enzymatic changes. The quality, flavor, and texture are kept intact and vitamins safeguarded because the enzyme action is arrested.

Usually fruits and vegetables which are preserved by freezing are frozen at temperatures of from zero to 40 degrees below zero F. These low temperatures not only inactivate all microorganisms, which are the principal cause of food spoilage, but they also inactivate the enzymes which are destructive to the quality of the products.

In the case of fruit no heat is used to kill the microorganisms or enzymes. All vegetables, however, should be properly blanched. This greatly reduces the number of microorganisms, and is a means of inactivating the enzymes. If enzyme action is not checked, the color, flavor, and general quality of the vegetable are slowly changed even at storage temperatures below zero degrees F.

The blanching procedure is the most important step in the preparation of vegetables for freezing. This process is usually done in boiling water or steam for 2 to 5 minutes, then the product is subjected to a thorough spray of cold water rapidly to reduce the temperature as low as possible. The next step is the actual freezing, accomplished by one of several methods. One method is to pack the product in cartons, paper cups, or cans which are sealed or wrapped ready for distribution. They are then frozen either between moving belts in a refrigerated cabinet, or in trays in refrigerated rooms, in blasts of refrigeration, or by other methods. The packaged foods are then cased and taken to refrigerated storage rooms which are usually held at about zero F.

Another method rapidly gaining in popularity is accomplished by spreading the product on wire mesh belts which travel through refrigerated rooms. The cold air is forced down through the product as it passes through the room and effects very rapid freezing during which individual pieces do not cling together and therefore are more convenient for use if only part of the package is used at a time.

The quality of the product to be frozen is of equal or perhaps greater significance than the freezing method. The variety of fruit used, its maturity, freshness, method of preparation or packing, or even the storage conditions influence the quality of the frozen product considerably. The evenness at which the storage temperature is held has been found greatly to influence quality. Best results are obtained

where the holding temperatures do not vary more than one or two degrees F.

Quite often the question arises as to whether toxins of *Clostridium botulinum* can develop in non-acid foods preserved by freezing. There is no danger from this organism, as it cannot develop and grow at the specified temperatures. Other types of spoilage, such as souring, always develop much more rapidly than could botulinus toxin if and when the product is removed from cold storage, and this precludes any possibility of botulinus. The frozen vegetables are not usually stored under anaerobic conditions, a condition necessary if botulinus is to develop.

Sixty-four per cent of the nation's frozen foods is packed in the West, several of the largest plants being located in Oregon and Washington. Fourteen vegetables were frozen in large quantities in the Northwest last year, likewise large quantities of all berries and nearly all other fruits. Most of these were packed in a large assortment of sizes of pack, 12 oz., 2 lb., 10 lb., 15 lb., and 30 lb. As for style, there are several types of packs for fruit—dry fruit, whole fruit plus sugar, whole fruit plus syrup, sliced fruit plus sugar, and pulped fruit with or without sugar.

When purchasing quick-frozen foods it is desirable to obtain at one time only such quantities as can be used in a day or two unless storage facilities are available which can be held as low as zero to five degrees above zero F. Temperatures lower than this are even more desirable.

"Children Starve in This Land of Plenty"

In the *Ladies' Home Journal* for April 1939 Dorothy Thompson, noted woman writer, political commentator and foreign correspondent, points out that the most important fact about the United States is that our population is growing fastest in the states with the lowest standard of living, and slowest in the communities where housing, nutrition and schooling are best. The new population of America is being produced by the poor, and those on relief represent the most prolific of the population.

Thus the trilogy of poverty, malnutrition and children continues, and just how great is the problem of malnutrition among infants and school children in America, no one, Miss Thompson feels, seems to know precisely. In 1930, it was estimated that one-eighth of our children were undernourished and in 1933 Dr. Martha Elliott of the Children's Bureau put it as high as a fifth.

Malnutrition, while perhaps primarily an economic question, is not wholly that. Inferior diets, notably in some sections of the South, are followed because of preference and custom. If this problem of the malnourished child is as great as we are told, why do we not do something about it?

Almost all children between 6 and 14 years are in public schools; that is, for from five to seven hours of the day they are under the supervision of the government, for schools are government institutions. The government assumes the responsibility for their being able to read and write, a responsibility which costs the country more than two billion dollars every year; but, as Miss Thompson says, "if we are imparting skills to rachitic limbs and attempting to get enthusiasm from children who are underfed we are simply wasting our money".

She feels that if a child is entitled to eight years of schooling he ought to be

entitled to eight years of nourishment. The old Greek concept of a sound mind in a sound body remains the ideal of education. She believes that much of the current lethargy in class and on the playground can be directly attributed to lack of a proper breakfast or even a suitable supper the night before.

Miss Thompson believes that a country that spends about one-fifth of the national income collectively, that is, through the various branches and agencies of the government, can see to it that children get sufficient vitamins as well as sufficient arithmetic. She feels that in the end the saving to the nation would be enormous. We would have fewer sick children and ailing adults, fewer incompetent and lackadaisical workers, fewer costly epidemics, and fewer diseases which derive from malnutrition.

But most important of all, perhaps, through school lunches under the direction of competent dietitians we would have an opportunity to educate children to become accustomed to a more reasonable diet. For children can be taught, and the sound diet principles learned in the school room will be carried over into future homes.

CURRENT COMMENT

The Nutritional and Practical Aspects of Quick-Frozen Foods

The fine quality of many varieties of fruits and vegetables preserved by quick-freezing has created an unusual interest in them. It has been estimated that 60,000,000 pounds of fruit and 16,000,000 pounds of vegetables were preserved by freezing in 1936, and that 32,000,000 pounds of vegetables were so treated in 1937. Freezing as a means of preserving vegetables is a relatively new process, but one which has made remarkable progress during the past few years. Meats, fish, and fruits had been preserved by freezing for many years before the process was adopted for vegetables. With the exception of tomatoes, lettuce, and celery, nearly all vegetables can be readily frozen and stored for long periods of time without a substantial change in quality.

Quick-freezing and subsequent cold storage do not cause any considerable loss of the carbohydrate, protein, fat, and mineral contents of fruits and vegetables. Thawing, however, is accompanied by leakage in which some of the soluble nutrients may be lost. In the case of fruits, if the juices leaking out are eaten, there will be little loss of these components due to thawing. With vegetables this loss of soluble nutrients due to thawing may be avoided if the still frozen vegetable is put on to cook in a very small amount of water and the cooking water is served with the cooked vegetable.

Vitamin C is the vitamin most likely to be lost during preparation for freezing and freezing preservation. This factor is the one which has been studied most extensively by nutrition workers. Fellers'[1] final conclusion concerning the vitamin C potency of frozen vegetables is: "Cooked, frozen vegetables are slightly lower in vitamin C than fresh cooked, but considerably higher than the canned vegetable which has been heated for the table."

[1] Fellers, C. R.: The vitamin content of important foods in the child's diet, Am. J. Pub. Health, 25: 1340–1345, 1935.

From a study of the vitamin A content of fresh market and commercially frozen fruits and vegetables, Fitzgerald and Fellers[2] concluded that frozen products retain practically all of their vitamin A during processing and freezing. Storage at low temperatures in a practically impervious package out of contact with ultraviolet light indicated that conditions of marketing frozen foods are conducive to complete retention of vitamin A up to the time of delivery to the consumer.

that: "While quick-frozen vegetables retain higher percentages of vitamins B_1 and $B_2(G)$ than canned vegetables, still both types of preserved foods are very good sources of these two water soluble vitamins."

From the standpoint of nutritive qualities, quick-frozen fruits and vegetables may be considered practically as good as the fresh market product.

To the housewife quick-frozen vegetables possess many advantages as they are of uniform quality, require almost no handling, and yet possess most of the

Equivalent values of fresh and frozen vegetables

VEGETABLE	FRESH WT. EQUIVALENT TO 1 LB. FROZEN	FRESH, COST PER LB.	TOTAL COST	FROZEN	
				Cost per lb.	Saving per pound by buying frozen vegetable
	lb.				
Spinach	2.5	$.138	$.34	$.23	$.11
Peas	3.3	$.123	$.41	$.25	$.16
Peas and carrots	2.75		$.287	$.23	$.057
Cauliflower	3.0		$.28	$.19	$.09
Baby Lima beans	3.75	$.15	$.56	$.25	$.31
Broccoli	2.0	$.115	$.23	$.23	No saving in price but ready to cook with no additional waste
Corn off cob	6 ears		$.30	$.23	$.07
Corn on cob	$.08 to $.10 per ear			2 ears for $.16. No saving	

Very little work has been reported concerning the effect of quick-freezing on the vitamin B_1 and $B_2(G)$ content of vegetables. Fellers, Esselen, and Fitzgerald[3] noted that the length of time of the blanching process appears directly to influence the retention of these vitamins in frozen vegetables. They concluded

[2] Fitzgerald, G. A., and Fellers, C. R.: Carotene and ascorbic acid content of fresh market and commercially frozen fruits and vegetables, Food Research, 3: 109–120, 1938.

[3] Fellers, C. R., Esselen, W. B., Jr., and Fitzgerald, G. A.: Vitamin B_1 and $B_2(G)$ content of vegetables as influenced by quick-freezing and canning, Plant Physiol. (in press) 1939.

desirable characteristics of fresh vegetables. They require little preparation and can be cooked in a shorter time than fresh vegetables. Frozen vegetables are being used more and more in hotel, restaurant, and institution kitchens. The advantages of frozen foods under such conditions are obvious. These products are sold on a net weight basis and there is no waste, as the inedible hulls, stems, and leaves have been removed. In the case of spinach there are no wilted leaves or sand to be removed. Frozen vegetables do not stand up as well on a steam table as do

fresh vegetables but since they cook more rapidly, they may be cooked in small amounts, as required, thus avoiding the necessity of holding on a steam table.

As regards cost (and disregarding the labor cost in preparing fresh vegetables), frozen vegetables are frequently less expensive than fresh vegetables, especially in off seasons. That such is true may be seen in the foregoing table based on average prices on the New York retail market for October.[4]

In a survey on the public health aspects of frozen foods Fellers[5] concluded that: "Freezing greatly reduces the numbers of microorganisms present in foods, and prevents their multiplication. Emphasis should be placed on the prompt utilization of frozen foods. Until more is known about the subject, frozen products should be consumed immediately or within a very few hours after defrosting. Spoilage occurs very quickly in vegetables after defrosting. The ready availability of a large variety of frozen foods at all seasons will serve to give variety and balance to the human diet and should aid in decreasing nutritional deficiency diseases."

It would thus seem that we may expect quick-frozen fruits and vegetables to assume a more important rôle in the American dietary on a basis of their price, quality, and convenience. The more extensive use of high grade frozen vegetables will also help to educate the public to expect only the highest quality in fresh vegetables.—WILLIAM B. ESSELEN, JR., *Nutrition Laboratory, Massachusetts State College, Amherst, Mass.*

[4] Editorial: Equivalent values of fresh and frozen vegetables, Quick Frozen Foods, 1: 3, pp. 28–37, 1938.

[5] Fellers, C. R.: Public health aspects of frozen foods, Am. J. Pub. Health, 22: 601–611 1932.

THE FOOD, DRUG AND COSMETIC ACT[1]

The enforcement of the Food and Drug Act of 1906 was found to be rather difficult; definitions were either too broad or too narrow in their applications. For example, "label" was taken in the strict sense of the word to mean only the label affixed to the bottle and did not include descriptive matter such as circulars, pamphlets and other literature attached to or enclosed within the container. In instituting a suit against a manufacturer the burden of proof of deceit by that manufacturer was placed directly upon the government. In addition, the government was compelled to prove that the manufacturer had been fully aware of the fact that he had deceived the public. In the Department of Agriculture in Washington there is an exhibit that well compares with a small-town museum in size. Sufficient evidence is assembled there as to leave no doubt of the urgent need for adequate laws regulating the distribution of food, drugs and cosmetics.

Reputable manufacturers, scientists and legislators, therefore, readily welcomed the enactment of the new Food, Drug and Cosmetic Act which was passed by Congress and signed by the President on June 25, 1938. It is hoped that the regulations interpreting the law are such that instead of hindering, the law will benefit business in general, and that enough money will be allotted to

[1] Abstract of an address read before The Greater New York Dietetic Association, New York City, December 5, 1938.

the Department of Agriculture so that a sufficient number of properly trained and qualified personnel may help reputable manufacturers and protect the consumer.

Since the dietitian's chief concern is foods, I shall cover that part of the new law which deals with foods and give only scant attention to that concerning drugs and cosmetics.

According to the Act, the following come under the definition of *food:* "(1) articles used for food or drink for man or other animals; (2) chewing gum; and (3) articles used for components of any such article."

The following come under the definition of *drug:* "(1) articles recognized in the official United States Pharmacopoeia, official Homeopathic Pharmacopoeia of the United States, or official National Formulary, or any supplement to any of them; and (2) articles intended for use in the diagnosis, cure, mitigation, treatment, or prevention of disease in man or other animals; and (3) articles (other than food) intended to affect the structure or any function of the body of man or other animals; and (4) articles intended for use as a component of any article specified in clause (1), (2), or (3); but not to include devices or their components, parts, or accessories."

The following come under the definition of *cosmetic:* "(1) articles intended to be rubbed, poured, sprinkled, or sprayed on, introduced into, or otherwise applied to the human body or any part thereof for cleansing, beautifying, promoting attractiveness, or altering the appearance, and (2) articles intended for use as a component of any such articles; except that such term shall not include soap."

The new law prohibits the addition of a "poison" to food except where such addition is required in the production thereof or cannot be avoided by good manufacturing practise. Where added poisons are so required or cannot be avoided, tolerances are authorized limiting the amount to a point insuring protection of public health. Where such addition is required it is also required that it be stated. When such substances have to be added the Secretary of Agriculture shall take into account two things: the extent to which the use of such a substance is required or cannot be avoided in the production of each of these articles, and how the consumer may be affected by such poisonous or deleterious substances.

The law authorizes emergency permit control of food that may be injurious because of contamination with microorganisms, if public health cannot otherwise be protected.

The Secretary of Agriculture or his agent is authorized to suspend immediately upon notice any permit issued under authority of this section, if it is found that any of the conditions of this permit have been violated. The Secretary or his agent has the authority to enter the premises of a licensed manufacturer to inspect the place to see that the conditions of the permit are being complied with, and denial of access for such inspection shall be ground for suspension of the permit until such access is freely given by the operator.

The law forbids traffic in confectionery containing metallic trinkets and other inedible substances. It specifically requires label declaration of artificial coloring, artificial flavoring, and chemical preservatives in food, but exempts

butter, cheese, and ice cream from this requirement in so far as artificial coloring is concerned.

The labeling of a special dietary food is required to inform purchasers fully of its vitamin, mineral, and other dietary properties. This means that the vitamin content must be expressed in units and will require the manufacturer to be certain that his product is stable as far as vitamins are concerned.

The law provides for the promulgation of a definition and standard of identity and a reasonable standard of quality and fill of container for each food, but exempts from this provision fresh and dried fruits and vegetables, except avocados, cantaloupes, citrus fruits, and melons. Butter is also exempt from this provision, but the act preserves the statutory definition and standard of identity for butter which became law in 1923.

The law requires that the labels of a food, for which no definition and standard of identity had been fixed, disclose the separate ingredients by name, except in the case of spices, colorings, and flavorings, which may be given a group designation as spices, colorings, and flavorings. It authorizes regulations prescribing exemptions from this requirement where compliance is impracticable or results in deception or unfair competition. Foods not required to state ingredients or labels are those for which there is an established standard such as cheese, jam and candy, all of which must conform to the set standard. A pudding or a custard base, but not a finished custard, must bear the formula on the label. There will be definite requirements established for a finished custard with regard to its content of eggs and milk.

The law proscribes the use of containers for food, drugs, and cosmetics which may render the contents injurious to health. This is a very important point as the effect of containers on the food may be such as to render the food injurious.

The law prohibits marketing of food, drugs, and cosmetics prepared or handled under unsanitary conditions which may render them injurious to health. The enforcement of this ruling will require cooperation between the local health authorities and the federal government.

The law forbids the use of uncertified coal-tar colors in food, drugs, and cosmetics. It proscribes slack filling of containers for food, drugs, and cosmetics, and prohibits the use of deceptive containers. It authorizes factory inspection of establishments producing food, drugs, devices, and cosmetics for interstate shipment. The law requires that part of samples collected by the government for analysis be given to the manufacturer on request, but provides exemption from this requirement to the extent necessary for proper administration of the Act.

To summarize: the new law as far as foods are concerned promulgates sanitary manufacturing conditions, distribution of non-injurious foods, declaration on the label of the amount of preservative added and the control of such preservatives. It requires that the containers shall not be injurious and that they be not misleading or deceiving in size. Further, the labeling shall not be misleading or deceptive.

Under regulations for cosmetics, injurious eyelash dyes are prohibited and hair dyes of the coal-tar group must bear a special caution label with the following

wording: "Caution—This product contains ingredients which may cause skin irritation on certain individuals and a preliminary test according to accompanying direction should first be made. This product must not be used for dyeing the eyelashes or eyebrows; to do so may cause blindness."

Any product the label of which bears the term "antiseptic" must be tested in accordance with circular No. 198 of the U. S. Department of Agriculture and proved to be germicidal or, if in contact with the body for a longer length of time such as salves, dusting powders, creams, plasters, pads, adhesive tape and suppositories, must be at least inhibitory.

The need for this new law was manifest. It meets with the approval of those manufacturers who desire to serve the public honestly. It also meets with the approval of scientists as it places some of the burden of responsibility on their judgment. It is our sincere hope that the administrators of this law will work in harmony with the manufacturers and with their appointed scientific advisers as well as the scientific staffs of research, university and private laboratories, toward one common end, the protection and safeguarding of the health and welfare of the consuming public.—NICHOLAS M. MOLNAR, *B.S., M.A., F.A.I.C., Director, Molnar Laboratories, New York City.*

COLORFUL CALIFORNIA

At last your dreams can be realized—vacation spots in California may be visited on the same trip that brings you to the American Dietetic Association meeting in Los Angeles. Such a variety of places and spaces awaits you that the difficulty will be not what to see, but what you must forego on a trip where time of necessity is limited. Whether it is scenery which pleases you most, or a visit to a dude ranch, or flowers and sunsets, or the relaxation of hot springs, the choice can be yours.

Boulder Dam may be foremost in your thoughts of a western trip. Boulder City, governed by the Bureau of Reclamation under federal jurisdiction, is seven miles from the dam itself, behind which may be seen Lake Mead, the world's largest man-made lake. Imagine an artificial lake, 115 miles long, with over 500 miles of coast-line! This lake adjoins the western boundary of the Grand Canyon, and affords some of the most awe-inspiring scenery in all America. At the dam, a descent can be made by elevator, 528 feet down, to see the world's largest generators, the penstock tunnels, and the view of the dam below.

Yosemite Valley is another great attraction to many. Of course you will not be able to be there for the winter sports, but its beauties are no less inspiring during the summer months. Glacier Point, Half Dome, El Capitan, Bridal Veil Falls, each one of these alone would be worth the trip. As a Californian, I believe that if they were anywhere but in California, they would rank with such scenic wonders as Niagara, but that of course is the exaggerated point of view of a Californian, who always looks at anything as though it were under a magnifying glass. If you wish to spend part of your vacation deep in the heart of a cool, quiet valley, Yosemite is the place for you.

Not far from Yosemite are the giant Sequoia trees of Sequoia National Park. This park, established in 1890, is the

second oldest of our national parks, covers an area of 604 square miles, and contains the largest trees in the world. Think of a tree as tall as many city skyscrapers, with a trunk as wide as a city street, a tree estimated to be between 3000 and 4000 years old! Such a tree is the General Sherman, which is 36.5 feet at its greatest diameter and 272.4 feet high.

Death Valley, rather the opposite of grandeur, especially when compared with the cool, lush valleys of Yosemite and the magnificence of Sequoia, will be a unique experience for many. It lies not far from Sequoia National Park and Mount Whitney, about 300 miles northeast of Los Angeles, is approximately 150 miles in length and from 6 to 20 miles wide between the mountain ranges within which it lies. From Dante's View, 6000 feet above sea level, you may see at Bad Water the lowest point on the American continent, a sheer drop 280 feet below sea level. Ryan, with its narrow-gauge railroad, is the point from which the Pacific Coast Borax Company operates. Also at Death Valley can be seen the palatial home of Death Valley Scotty, whose source of wealth has never yet been explained. Some believe that he has a well hidden gold mine, from which he removes ore to meet his needs. But whatever the answer may be, Death Valley Scotty does not tell. Although the floor of the valley consists largely of almost impassable salt beds, it also is rich in minerals (and I almost said vitamins, too). Fossils and footprints of prehistoric birds and animals abound, and here you can still see the "ghost towns", so famous in Gold Rush stories—the forsaken villages of Panamint, Skidoo, Keane Wonder, and Leadfield.

Going farther south, but still on the desert, you will find the world famous winter resort, Palm Springs, with its luxurious hotels and Joshua trees. The rugged grandeur of the mountains and the low rolling sand wastes of the valleys present a contrast not soon forgotten. At Palm Springs, sheltered by the San Jacinto Mountains, the Smoke Tree Ranch within its 300 acres has the largest Smoke Tree forest in the world. The Desert Inn, El Mirador, and Deep Well Guest Ranch, all offer a wide variety of guest accommodations. Here at Palm Springs, really an oasis in Coachella Valley, are found the date palm trees which supply America with delicious fruit. This industry is quite recent, for fifteen years ago the growing of date palms was still in the experimental stage. Not far from this lovely valley are Banning, famous for its cherry blossoms; Beaumont; Riverside, the gateway to Big Bear Lake; Lake Arrowhead, and the other famous mountain resorts; San Jacinto, where "Ramona" was written, and where are found such hot springs as Gilman, Sabobo and Eden. Here, too, is the western portal of the fourteen-mile tunnel of the Colorado River Aqueduct.

No discussion of California vacation spots would be complete without some information concerning the beaches. Carmel and Monterey, halfway between San Francisco and Los Angeles, are famous for their scenery, Monterey cypress and the artists' colony. Ventura, the city of poinsettias, has its oil wells out in the surf, and the Mission San Buenaventura. Santa Barbara has its lovely fiesta in the old Mexican style, its Mission Santa Barbara and its

wealthy winter colony. As you go south along the coast, Santa Monica, Newport and Balboa, Laguna, Lajolla, San Diego and Coronado offer an ever changing beauty of seacoast, so much like that of the French Riviera that it has often been called the American Riviera. Each, in its beautiful setting, offers its own special attraction—fishing, surf-boat riding, bathing, and other recreational advantages. Ensenada, in lower California, offers all the charm of a foreign country and yet is so near that it can be visited and enjoyed in a short week-end.

But we must not forget Catalina Island, only a few hours by boat, and a few minutes by plane from the harbor of Los Angeles. Glass bottom boats reveal the wonders of the Submarine Gardens. The architecture is of the Mediterranean type, and the Casino, the beautiful homes, the Catalina potteries, coupled with such activities as swimming, hiking, and dancing, offer the visitor everything which one could wish for a most enjoyable vacation.

Each of you may feel that perhaps my descriptions have been too highly colored by the enthusiasm of a Californian, but I ask you only to see for yourself. Come to California, if only to discover what makes us all resort to superlatives. Once you do come, I know that you will feel that we have not really done justice to all the beauties that are ours and can be yours if you will but let us lead the way.—OCTAVIE DE BEAULIEU, *Olive View Sanatorium, Olive View, California.*

BOOK REVIEWS

Have You Had Your Vitamins? By Harry N. Holmes. New York: Farrar and Rinehart, Inc., 1938, pp. 60. Price $1.00.

Dr. Holmes wields a pen with a punch. He does more than mildly suggest the life-saving salad to his bread, meat, apple pie and coffee consuming reader who is a bit contemptuous of the fresh green salad. To such the dire warning is given: "he will probably come to no good end—and that all too soon. Something is almost certain to go wrong with his inner and intricate machinery." He then proceeds to dramatize the story of the vitamins, beginning with Lunin's experiment, Gowland Hopkins' coining of the neat phrase "accessory food factors", and Funk's devising of the term "vitamin" that has caught and held the popular fancy for nearly 25 years.

He then takes up the vitamins, seriatim, including brief summaries of the historical aspects, the uses of each in normal nutrition and diet therapy, the sources in common foods and ways in which "natural" sources may be protected in cookery or supplemented with concentrates.

Dr. Holmes, who with his research associate, Ruth E. Corbet, was the first to isolate the crystals of vitamin A, presents his factual data convincingly and interestingly. Within the small space of 56 pages he covers all the essentially practical points of our present knowledge of the vitamins.

He feels that it is assuming a little too much to dismiss the whole matter by assuring people that the ordinary American diet will take care of all the necessary vitamins: "There is danger in over-milling of grains, in discarding water in which vegetables are cooked, in lack of sunshine at certain seasons, in allergies to important foods, and in individual sensitivity to roughage." Therefore it is reasonable to expect that many people have profited by supplementing their daily diet with certain vitamin concentrates. "If teeth and bones are sounder, if vision in dim light is improved, if sub-normal appetite is increased, if the digestive tract is toned up, if a little more zest is added to existence, if colds are fewer or briefer or less severe for many people, it would seem that the happiness gain and the economic gain outweigh any imaginary risks and the economic cost of a few cents a day."

Yet to be perfectly safe, you will be wise in asking your doctor's advice before embarking upon such vitamin voyages. . . .We certainly do not believe in reckless over-dosing without advice of physician or reputable manufacturer."

The appendix includes food sources of vitamins; suggestions for further reading, tabular outlines covering complete summations to date on each of the vitamins, and an index.

Recipes and Menus for Allergics. By Myra May Haas in collaboration with Nathan Schaffer, M.D. Menus by Cay Hillegas. Illustrations by O. Soglow. New York: Dodd, Mead & Company, 1939. Price $2.50.

The book contains an excellent 19-page preface by Dr. Schaffer in which he lists the major manifestations of allergic disorders, and the four modes of contact—inhalation, ingestion, inunction and injection. He details the principal offending substances, pointing out that the fourth mode of contact, injection, is becoming more important, due to the increasing use of certain drugs and serums administered by injection. He enumerates the major "pitfalls" and emphasizes that each patient becomes a separate and distinct problem, and that an allergist must be a detective.

Mrs. Haas divides her material into three sections, covering egg allergy, under which she lists a number of recipes omitting the use of egg; milk allergy, including milk-free menus; wheat allergy, with wheat-free recipes; egg and milk allergy; egg and wheat allergy; milk and wheat allergy; and egg, milk and wheat allergy. Her final chapter deals with culinary suggestions for the unhappy victim who reacts to a variety of food substances. The menus suitable for egg-free, milk-free and wheat-free diets, preceding each chapter, have been assembled by Cay Hillegas.

Diet Manuel of The Mount Sinai Hospital. New York City. Third edition, 1939, pp. 131.

The current edition has been compiled and revised by the dietitians on the staff of the hospital with the assistance of members of the

medical staff. It is conveniently bound in loose-leaf style with flexible cover, very legibly printed and arranged in a practical and usable form. The contents include a summary of the requirements of the adequate diet, classification of hospital diets, and a great variety of special diets such as acid, alkali, bland, dehydration, high calcium, high iron, Karell, ketogenic, and so on.

Special features include a wide variety of diabetic diets classified as full, liquid, and soft. Special instructions are given for dietary modifications for use in protamine insulin therapy. The Pirquet system of nutrition is detailed. The outline for elimination diets for use in allergy is especially commendable. The customary weight-height-age and food tables are included.

Women at Work—A Tour Among Careers. New York City: New York Career Tours Committee, 353 West 57 Street, 1939, pp. 100. Price $1.00.

This is an attractive, beautifully designed and printed book, which has been written by business and professional clubwomen of the United States, and dedicated to "every woman who has ever knocked on an office door in search of a job". It tells the story of women's entrance into the business and professional world and their progress for the past 50 years.

Margaret Culkin Banning, Inez Haynes Irwin, Dorothy Canfield Fisher, Ida M. Tarbell and Mary R. Beard, noted women writers, have contributed the main chapters of the book, in which the progress and mounting success of women in the fields of industry, science, the arts and medicine are dramatically reviewed and evaluated.

More than 75 women executives and leaders in their professions, serving as a board of consulting editors, have provided important information on their own fields of work, and the opportunities for women in the future. Among the contributors are Kate Smith, radio star, Nancy McClelland, decorator, Mrs. Hortense Odlum, president of Bonwit Teller and Company, Dean Virginia Gildersleeve of Barnard College, Dr. Lillian Gilbreth, engineer, Fannie Hurst, writer, Mrs. William B. Meloney of the New York *Herald Tribune*, Elizabeth Hawes, fashion designer, the Hon. Frances Perkins, Secretary of Labor, Dr. Florence R. Sabin, scientist, and many others.

Included in the contents of the book will be found valuable information regarding the more than 100 career tours which the 33 women's sponsoring organizations, including the American Dietetic Association, have arranged for out of town women visiting New York for the World's Fair. These tours will feature the actual itineraries "behind the scenes" in businesses and professions, arranged for architects, nurses, librarians, musicians, doctors, home economists, insurance women, editors, writers, lawyers, women bankers, artists, and so on, featuring every important field in which women work.

The photographs illustrating this book are the work of Margaret Bourke-White, staff photographer of *Life* Magazine; Berenice Abbott; Therese Bonney; Jackie Martin, photographer of the Washington *Herald-Times*; Marjory Collins, well known for her pictures of school children; Marvin Breckinridge and Ruth Rozaffy; and Elizabeth Hibbs, noted for her travel photographs.

CURRENT LITERATURE

American Journal of Digestive Diseases

Vol. 6, March 1939

*Pectin as a prophylactic and curative agent for peptic ulcers produced experimentally with cinchophen. M. Winters, G. A. Peters, and G. W. Crook.—p. 12.

*Gross hemorrhage as a complication of peptic ulcer. B. B. Crohn and H. H. Lerner.—p. 15.

*Aids to normal bowel function. J. A. Bargen.—p. 50.

PECTIN IN PEPTIC ULCER. Dogs treated with cinchophen showed 100% incidence of ulcer, while those given cinchophen and pectin showed an incidence of only 11.1% ulcers. In general all animals receiving the pectin were in excellent condition while those of the control group showed intermittent bloody diarrhea, anorexia and nausea. Pectin has prophylactic and curative properties for peptic ulcers produced experimentally with cinchophen.

HEMORRHAGE IN PEPTIC ULCER. The mortality rate from hemorrhage due to peptic ulcer shows an apparent increase in the last decade. Experience with the Meulengracht diet was not encouraging; starvation in the early period is still preferred. The problem of avitaminosis C in respect to hemorrhage requires further study.

NORMAL BOWEL FUNCTION. Present day life with its hustle, bustle and increased nervous tension has often interfered with proper bowel care. Improper eating habits have been adopted. Vegetables and fruits have not been taken in adequate amounts. The drinking of sufficient water and liquids of all kinds has been neglected. The incidence of constipation has been slowly but progressively increasing among civilized human beings. Three types of aids to intestinal evacuation are: (1) those increasing bulk, (2) those preventing absorption of water, and (3) those causing irritation of the small or large intestine. Clinical experience suggests that karaya gum is the best mechanical aid to intestinal evacuation on the market today.

American Journal of Diseases of Children

Vol. 57, February 1939

*Relation between plasma protein level and edema in nephrotic children. L. E. Farr and D. D. Van Slyke.—p. 306.

*Distribution of vitamin D in body after administration of massive doses. H. Vollmer.—p. 343.

PLASMA PROTEIN LEVEL AND EDEMA. In children with the nephrotic syndrome there is a close relation between the presence of edema and the level of the plasma albumin in the blood. Edema can be controlled in most instances by simple restriction of salt, together with an adequate diet, when the plasma albumin level is above 1.2 gm. per 100 cc.

VITAMIN D. Vitamin D administered in one massive dose is retained and stored in the child's organism. Most of it is stored in the skin, liver and the brain. The kidney contains less vitamin. The lungs, spleen and bones did not contain appreciable amounts of vitamin D.

American Journal of Physiology

Vol. 125, March 1939

*Studies on the vitamin K requirements of the rat. J. D. Greaves.—p. 429.

*Gonadotropic extracts from green leaves. M. H. Friedman and G. S. Friedman.—p. 486.

Vitamin E destruction by rancid fats. J. Weber, M. H. Irwin and H. Steenbock.—p. 593.

VITAMIN K REQUIREMENTS OF RAT. Young rats raised for extended periods on vitamin K-free diets developed hemorrhagic tendencies associated with a low blood prothrombin. Bile is a poor source of vitamin K but is essential for its absorption.

GONADOTROPIC EXTRACTS FROM GREEN LEAVES. It is possible to extract from the dried leaves of immature grasses a fraction which is capable of producing ovulation upon injection into rabbits. The chemical properties and its instability at low temperatures simulate the properties of gonadotropic material in anterior pituitary extracts.

Archives of Internal Medicine

Vol. 63, February 1939

*Abnormalities of calcium metabolism. F B. Taylor, P. Michael and L. Barnard.—p. 226.

*Diseases of metabolism and nutrition. Review of certain recent contributions. R. M. Wilder, D. I. Rutledge and D. L. Wilbur.—p. 350.

CALCIUM METABOLISM. Faulty calcium metabolism accounts for a wide range of discomforts and disabilities. Americans ingest too little

calcium. The body does not naturally conserve this element. If there is a shortage in the supply of calcium or if there is an increased demand, excretion proceeds without economy, and the organism is confronted with progressive deficiency. Oversupply of calcium is probably never a practical problem in human beings. Nine cases representing a variety of clinical patterns are presented in detail.

DISEASES OF METABOLISM AND NUTRITION. An excellent résumé of diseases of metabolism and nutrition, including comment on vitamins and other essential substances.

Archives of Pediatrics

Vol. 56, February 1939

*Can rickets be eliminated from the large cities? J. Levy and H. B. Silver.—p. 96.
*Whole milk plus carbohydrates in early infant feeding. E. T. Wilkes.—p. 106.

RICKETS. Ninety-one selected cases attending the Baby-Keep-Well Stations of the City of Newark showed some physical sign of rickets. The clinical histories revealed some evidence of a mild degree of rachitic involvement in between 25 and 30% of the cases. In March and April when rickets is most apt to show its active manifestations, only 10 in the entire group showed any evidence of involvement radiographically. The antirachitic program, supplying cod liver oil without cost to the mothers and encouraging its administration through close follow-up together with an educational program in the care and management of infants from immediately after birth, has had a practical effect in reducing the incidence of rickets in Newark to the point where it is no longer a clinical problem.

WHOLE MILK PLUS CARBOHYDRATES. Forty new-born infants fed boiled whole milk with added sugar were compared with 34 controls who were given the usual dilute milk mixtures with added sugar or breast milk. The weight curves of the whole milk group were slightly better than those of the controls. There were no unusual digestive disturbances or harmful effects from the concentrated feeding except for occasional foul smelling stools and gas in some babies. The incidence of infection and skin disease was the same in both groups.

Hygeia

Vol. 17, March 1939

*What is your community doing for its children? H. M. Williams and E. Saltzman.—p. 284.
*Teaching nutrition in the primary grades. E. F. Miller. —p. 256.

WHAT IS YOUR COMMUNITY DOING FOR CHILDREN? Diseases of behavior are transmitted by social infection. Mental disease follows on intolerable conditions of living; delinquency comes with neglect and wrong guidance. Public health commissions have alleviated physical disease contagions but cooperation of the entire community is necessary to alleviate mental disease.

TEACHING NUTRITION IN PRIMARY GRADES. An ingenious teacher made a practical study of nutrition popular in the second and third grades. Breakfasts were analyzed and improved. A complete Easter luncheon was planned and prepared by the children.

Journal of Biological Chemistry

Vol. 127, March 1939

*The distribution of electrolytes in mammalian tissues. J. F. Manery and H. B. Hastings.—p. 657.
*The dietary indispensability of valine. W. C. Rose and S. H. Eppstein.—p. 677.
*The early effects of parathyroid hormone on the blood and urine. M. A. Logan.—p. 711.

ELECTROLYTES IN MAMMALIAN TISSUE. A direct relation is found between the chloride and sodium, and an inverse relation between the chloride and potassium of many mammalian tissues.

VALINE AND GROWTH. Valine has been shown to be an indispensable component of food. Diets containing mixtures of highly purified amino acids were used to show this.

PARATHYROID HORMONE. The urinary phosphate excretion increases and the plasma inorganic phosphate usually decreases during the first hour after the administration of the parathyroid hormone. The results indicate that active excretion of phosphate by the kidney is one of the first effects of excess of the hormone.

Journal of Nutrition

Vol. 17, March 1939

* *The calcium requirements of five pre-school girls. J. Outhouse, G. Kinsman, D. Sheldon, I. Twomey, J. Smith and H. H. Mitchell.—p. 199.

*The utilization of carbohydrate in human undernutrition. M. W. Johnston, J. M. Sheldon and L. H. Newburgh.—p. 213.

*A note on the vitamin B_1-sparing action of fat. D. Melnick and H. Field.—p. 223.

Factors influencing the apparent energetic efficiency of productive processes in farm animals. S. Brody.—p. 235.

*The calcium requirement of adult man and the utilization of the calcium in milk and in calcium gluconate. F. R. Steggerda and H. H. Mitchell.—p. 253.

*The distribution of vitamin B_1 (thiamin) in meat and meat products. O. Mickelsen, H. A. Waisman and C. A. Elvehjem.—p. 269.

*The energy content of goat milk. V. E. Peterson and C. W. Turner.—p. 293.

CALCIUM NEEDS OF PRE-SCHOOL GIRLS. Five healthy, pre-school girls were given a basal diet generous in all of the known necessary nutrients except calcium. An attempt was made to determine the minimum amount of calcium which will insure maximum retention in well-nourished children over a comparatively long period of time. A pint of milk was sufficient for the calcium needs of these pre-school girls.

CARBOHYDRATE IN UNDERNUTRITION. The oxidation of carbohydrate by normal human subjects has been studied in the respiration chamber following various degrees of depletion of the carbohydrate reserves. The failure to oxidize all the ingested carbohydrate appears to be related to the degree of depletion. Impairment of oxidation occurred when the stores were greatly reduced by sharp reduction of the intake of calories and carbohydrate. The organism under these circumstances stores considerable portions of carbohydrate even though the energy expenditure far exceeds the intake.

VITAMIN B_1-SPARING ACTION OF FAT. Chemical analyses have indicated that lard contains no thiamin, justifying the conclusion that the vitamin B_1-sparing action of fat cannot be attributed to actual administration of the vitamin but to the decreased metabolic requirements for thiamin when the fat content of the diet is increased.

CALCIUM REQUIREMENTS OF ADULT MAN. The calcium balance of an adult human subject receiving a basal low-calcium diet with varying supplements of calcium in milk solids and in calcium gluconate was followed throughout 43 four-day periods. For equilibrium 9.2 mg. of calcium per kilogram of body weight per day were required, about three-fourths of which were supplied either in milk solids or in calcium gluconate. The calcium in both forms was equally well utilized, but only to the extent of 20%.

DISTRIBUTION OF VITAMIN B_1 IN MEAT. A large number of meats and meat products have been tested for their vitamin B_1 content. A study was made of the stability of the vitamin under various types of household cooking. There was a slight destruction of the vitamin during frying, but with roasting, broiling or stewing, the destruction of the vitamin approached 50%. Levels of fat up to 20% had no influence on the validity of the assays. A biological method of assaying various materials for their vitamin B_1 content has been described.

ENERGY CONTENT OF GOAT MILK. The energy value, fat, nitrogen, lactose, inorganic and total phosphorus, and total solids were determined on 18 samples of goat milk collected in various stages of lactation. One pound of 4% goat's milk was found to have an average energy value of 342.28 calories in comparison to 343.66 calories for cow's milk.

Journal of Pediatrics

Vol. 14, February 1939

*Studies in the use of crystalline vitamin C (ascorbic acid) in the prophylaxis and treatment of infancy and childhood. A. S. Kenney and M. Rapoport.—p. 161.

CRYSTALLINE VITAMIN C. Nineteen infants were given crystalline vitamin C in the dosage of 1.83 mg. per kg. daily for 5 months. No clinical evidence of scurvy was observed. Satisfactory healing was obtained when crystalline vitamin C was used in the treatment of 21 cases of infantile scurvy. There was no constant effect produced upon the capillary resistance of scorbutic infants following the administration of vitamin C. Crystalline vita-

min C stimulated wound healing in the incision of an infant operated on for pyloric stenosis. Complete case histories of three infants treated with crystalline vitamin C are given.

Journal of the American Medical Association

Vol. 112, March 4, 1939

*Treatment of edema. Conference on therapy.—p 837.

Vol. 112, March 18, 1939

*Trichinosis in the United States. Current comment.—p. 1074.

*Tuberculosis in dressed poultry. Current comment.—p. 1074.

EDEMA. Factors which require consideration in every case of edema are diet (protein content, acid or alkaline ash), salt intake, diuretic agent and special measures directed to the underlying disease itself. Children show a positive nitrogen balance when given 1, 2 and 3 gm. of protein per kg. of ideal body weight. When the protein is increased above this level, there is a decrease in the nitrogen assimilated so that the child may be in negative nitrogen balance. Experimentally, lactalbumin, casein and beef protein have about the same quality with regard to regeneration of plasma protein.

TRICHINOSIS IN THE UNITED STATES. It is estimated that there are 48,000,000 cases of trichinosis in the United States. Recent evidence from necropsies shows that 36% of the inhabitants of Cleveland have trichinosis. This city is not the most highly infected area.

TUBERCULOSIS IN POULTRY. About 3% of the dressed poultry offered for sale in American markets is infected with tuberculosis. Since there is no practical method of postmortem inspection which will disclose the presence of the tubercle bacillus, rearing of fowls for food markets should be prohibited in environments known to be infected with avian tuberculosis.

Medical Officer

Vol. 61, February 11, 1939

*An investigation into the diet of families with children of school-age and under in an urban area and a rural area. C. F. Brockington.—p. 55.

DIET OF FAMILIES WITH SCHOOL-AGE CHILDREN. The period after the child has entered school until he leaves and begins to earn, which should be one abundantly provided with the first class protein foods of growth, is the period when these foods are least in evidence. Such departure from recognized standards calls for a remedy. Provision for a mid-day meal at school is to be commended.

Nebraska State Medical Journal

Vol. 24, March 1939

*Newer developments in child nutrition. P. C. Jeans.—p. 92.

*Anorexia. A. G. Dow.—p. 96.

*Nutrition as affected by the economic level. G. E. Robertson.—p. 98.

CHILD NUTRITION. The average American diet is deficient in calcium, in vitamins A, B and D and to some extent G. A quart of milk contains 4 to 6 times as much calcium as all of the rest of the child's diet together. Growth is a function of nutrition. It is in the nutritional factors that one has most control. If sufficient emphasis is put on protective foods, all the vitamins and minerals will be provided in abundance except vitamin D.

ANOREXIA. Many children stop eating many days before there is any apparent sign of acute illness. No child voluntarily eats the same amount of food each day. The intake depends on metabolic rate. Allergy, constipation, teething or fatigue may cause anorexia in children.

NUTRITION AND ECONOMIC LEVEL. The use of suboptimal diets is widespread in all economic classes, but especially in the low income groups. Subclinical deficiency states occur more frequently than they are recognized. Many families have such a limited budget that an adequate diet is impossible. Free milk distribution and school lunches have been of inestimable value in maintaining the nutritional position of the American child.

New York State Journal of Medicine

Vol. 39, March 1939

*Topical application of vitamin A. W. H. Eddy and J. L. Howell.—p. 406.

TOPICAL APPLICATION OF VITAMIN A. Both carotene and vitamin A were absorbed by

intact rat skin in sufficient amount to stimulate growth, but carotene was better absorbed than the pure vitamin.

Ohio State Medical Journal

Vol. 35, March 1939

*Hyperparathyroidism. H. F. Koppe.—p. 257.

HYPERPARATHYROIDISM. The overproduction of the parathyroid glands affects the calcium and phosphorus equilibrium, producing an increased mobilization of the calcium in the body fluids, with increased calcium and phosphorus losses in the urine, kidney changes and frequently bone changes. Feeding a high calcium diet will arrest and improve the skeletal decalcification. This increases the calcium excretion and in the presence of kidney damage would further impair the kidneys. This danger is greater when a high phosphorus diet is given.

Public Health Nursing

Vol. 31, March 1939

*The forgotten child. D. B. Nyswander.—p. 135.

THE FORGOTTEN CHILD. The "forgotten" child is the normal child who has no physical defects and causes the teacher no particular trouble. An effort should be made to educate all parents, teachers and children in sound attitudes toward health facts.

Public Health Reports

Vol. 54, March 10, 1939

*Breast and lung carcinoma in "A" stock mice. J. J. Bittner.—p. 380.

CARCINOMA IN MICE. The breast-tumor incidence in mice is high in breeding females and low in virgin females. The lung-tumor incidence is high in virgin females and breeding males and low in breeding females. Diet may influence the breast-tumor incidence primarily through the physical condition of the individuals in determining the number reaching the cancer age.

INSTITUTION MANAGEMENT

The American Restaurant Magazine

Vol. 22, February 1939

*Getting the jump with strawberry pie. M. B. Strause.—p. 34.
*Meat cutting facts and figures. G. L. Wenzel.—p. 36.
*Shortening, fats, and oils in the restaurant progress.—p. 40.
*Down with crash costs . . . controlling china breakage. R. H. Moebus.—p. 42.
*China breakage report charts.—p. 44.
*A restaurateur's chip-resisting teapot.—p. 45.
*Be different with your menus. L. D. Freeman.—p. 50.

STRAWBERRY PIE. Strawberry pie, featured when berries first appear, satisfactory in quality and quantity, in late February or early March, adds zest to the menu and brings increased sales. Strawberries for pies should be carefully chosen for flavor, appearance and cleanliness. "Dry cleaning" by rolling berries back and forth in cheese cloth cleans the fruit and holds the flavor usually lost in washing. Recipes for Mr. Strause's famous strawberry pies and a delicious transparent glaze are given.

MEAT CUTTING. Butchering tests made at the Institute of Fine Cooking revealed a startling variation between price per pound of wholesale cut and pound edible meat. Charts show tests of veal legs, lamb steaks, smoked ham steaks, fowl and shell loins with market price, cost, grade or quality, and gross weight, as these affect yield and cost of edible meat, fat, waste, and bones. Tests were selected to show low, average, and high yields of edible meat. Mr. Wenzel recommends making these tests, particularly when meat prices start to rise.

FATS FOR RESTAURANTS. Restaurants are using more fat and oil because of increased baking and deep fat frying. Most restaurants favor a hydrogenated fat or vegetable oil because of the high smoking point (450°F). Type to select varies according to the need of the restaurant. Salad oils are still used extensively for salad dressings. Lard is used less and less because of its low smoking point (360–385°F). Lard and hydrogenated fats are sometimes mixed for deep fat frying.

DISH BREAKAGE. Brandeis Restaurants, which handle approximately 36,000–40,000 pieces of china per 24 hours, have cut china costs 50% in last 2 years. The article describes a realistic and effective method of controlling dish breakage. Careful selection of type of china, in regard to weight, size, decoration, together with a check-up of dishwashing machine facilities, bus boxes, and storage space have helped secure this decrease. Further reduction was brought about by not allowing bus boxes to become overloaded, by placing rubber mats on floor around dish machine where dishes fall, and by following manufacturers' instructions in operating dishwashing machines. Other precautions were not allowing more than one dish to be wiped at a time, locating the depository in a proper and convenient place, and keeping china and silver washing separate. Employees are made aware of the need to handle china carefully by means of posters graphically portraying amount of breakage, cash value and the breakage caused by each employee, and the effect of noise, etc. China is dated with indelible ink to determine life of each piece. China inventory is taken every 30 or 60 days and is combined with the cost of new china put into circulation.

BREAKAGE CHARTS. Breakage charts used by Brandeis restaurant are shown. The china breakage chart is filled in each week by manager, and gives the number of each china and glass item broken by each employee during the week and the total cost of each item for each employee. The china inventory chart for each item of china and glass in use includes the present inventory by pieces of both new and used items, last inventory, number broken, cost per piece, number of new pieces, date new purchase, and cost of new pieces of each item of china and glass.

CHIP-RESISTANT TEAPOT. Description of a teapot having a chip-resistant inner rim and spout and a rubber nipple to be placed over the spout when not in use. The nipple is stored in a nook in the bottom of teapot when this is in use. Hall China Company now manufactures this teapot in plain colors under the trade name of "Clark ACO" teapots.

DIFFERENT MENUS. Original and ingenious ideas are described which help to revive the humdrum, drab menus of late winter and early spring.

Buildings and Building Management

Vol. 39, March 1939

Wanted: building managers. C. E. Galli.—p. 29.
*Using steam effectively. R. M. Price.—p. 36.
*Trouble-shooting with paint.—p. 40.
*What's new?—a review of modern building materials and equipment.—p. 60.

STEAM. Economical use of steam requires constant study and record keeping. Old buildings with antiquated equipment lose steam through poor combustion, faulty heat transfer, leaks, and overheating. Most studies prove that steam control systems, thermostatically controlled, operate more economically than private generating plants. A study of heating expense can be made by tabulating each year's total kilowatt hours. When this generating cost is compared with the power rates and privileges extended the customer by a power company, definite proof of money loss is possible.

MAINTENANCE AND PAINT. This article graphically describes common types of paint failures. Practical pointers are given on types of painting surfaces, and methods of painting and resurfacing materials and finishes. Selection of good quality paint, proper preparation of surfaces before repainting, sufficient surface coverage, *i.e.* second and third coats of paint, all prevent too rapid deterioration of materials.

MAINTENANCE NEWS. Reviews modern building materials and equipment. The new fluorescent Mazda lamps for unusual lighting; a soap powder economizer produced by the G. H. Packwood Manufacturing Company; Frick Company 3 and 5-ton refrigerators for commercial buildings; and information on cleaning agents from the Industrial Research Laboratories are highlights for the month.

Chain Store Age

Vol. 15, March 1939

*Dramatized selling turns customers into salespeople. L. Nevelow.—p. 21.
Cash in on news for effective advertising. H. A. Newton.—p. 23.

DRAMATIZED SELLING. Effective selling promotes the advantages of the product or item that appeal to the emotions and intelligence of the buyer.

Hospitals

Vol. 13, March 1939

The importance of small economies. N. W. Faxon.—p. 59.
Personnel problems in the small hospital. H. T. Branham.—p. 91.
*Dietary supervision and service in small hospitals. M. Gladin.—p. 104.

SMALL HOSPITALS. Organization and supervision of a dietary department in a 50-bed hospital. Discussion of housekeeping duties, buying and checking supplies, factors in planning menus, food service, therapeutic diets and food clinic work.

Hospital Management

Vol. 47, February 1939

*Samuel Merritt Hospital of Oakland, California. E. L. Slack.—p. 10.
*The milk laboratory steps out. Sister M. Dorothea.—p. 34.
*Do you serve good coffee?—p. 37.

NEW KITCHEN. Pictures and plans of new kitchen and storerooms and account of the organization of dietary department, as described by the superintendent.

MILK LABORATORY. Methods used to acquire a modern milk laboratory with a comparatively small outlay.

GOOD COFFEE? Method of improving the quality of the coffee served in institutions. Value of controlled heat shown.

Hotel Management

Vol. 35, March 1939

Free literature on decoration.—p. 6.
Before going on duty.—p. 12.
*How to select and train pantry girls.—p. 13.
*Oil and shortening study.—p. 28.
*Tips from a housekeeper's notebook.—p. 33.

PANTRY GIRLS. Base your selection of pantry girls on size, age, experience, health, education, speech, family, memory, morals, personality, lack of mannerisms, and dress. Train her to adhere to schedules, neatness in dress and uniform, cooperation, side work program, vegetable and fruit preparation, waste prevention, storage, arrangement, variety, and good use of tools. A chart shows points to check in her appearance and dress before she goes on duty.

OIL AND SHORTENING. Deep fat fried foods are profitable, popular, and digestible if good cooking oil or hydrogenated fat is used, properly heated and kept clean. Temperature charts for deep fat frying and the characteristics of fats for different uses—shortening, hot breads, pie making and salad dressings—are given.

TIPS FOR DECORATION. Tells how to refinish, add color, and introduce severe lines in modernizing old furniture. Paint necessary light fixtures in the wall with the same color or paint. Use a wall-paper border around the window frame to eliminate the use of drapes. Shorten rooms that appear to be too long by using advancing colors on either end. Use slide fasteners on slip covers.

The Hotel Monthly

Vol. 47, February 1939

*Why the "Boss Way" makes Boss hotels pay.—p. 21.
Confessions of an innkeeper.—p. 28.
*The art of professional institutional housekeeping.—p. 30.
*How carcass meats can be cut for lower food costs.—p. 50.
Hotel and restaurant beef chart.—p. 52.

FOOD AND BEVERAGE COST CONTROL. A simple standardized accounting system used by Boss Hotels, Iowa. Results obtained are: proper pricing to secure rigid food control of prepared dishes and adequate margin of profit; data on various meal combinations so that long and short profit items may be balanced to yield desired total profit; data to regulate production in relation to actual sales and control overproduction to a reasonable amount; definite standards of preparation through recipe and batch quantity control so that waste is prevented.

EXECUTIVE HOUSEKEEPING. A paper as presented by Mrs. Adele B. Frey, supervising executive housekeeper for the DeWitt operated hotels, Cleveland, for presentation to the students in home economics and hotel management, Cornell University. She states what institu-

tion housekeeping entails, and lists the executive responsibilities of this department and its relation to other departments in a hotel.

MEAT CUTS. Profusely illustrated article describing a meat-cutting demonstration by F. H. Helmreich, Armour & Company, before the Catering Executives Club of Chicago, which was designed to show how profits can be increased with better use of all cuts of carcass meats.

Journal of Home Economics

Vol. 31, March 1939

Factors affecting appetite. H. Camp and E. S. Eppright. —p. 149.
Midyear meeting of home economists in business. E. M. Barber.—p. 170.
*What we learn from serviceability studies. M. B. Hays. —p. 170.
The Neely Bill.—p. 173.
*The advisory committee report on vocational education. —p. 174.

SERVICEABILITY STUDIES. "Serviceability Studies", conducted at the Bureau of Home Economics, is the term applied to studies in which a textile or material is subjected to its normal use and records are kept of conditions and factors affecting the life of materials during use. These studies, which take years to complete, are indispensable to textile research, for there are no laboratory tests which compare with normal use.

VOCATIONAL EDUCATION. A staff study report of the Advisory Committee on Education, as written by John Dale Russell and associates, receives editorial comment. Sections in the report of interest to home economists are: "Development Vocational Programs in Schools"; "Federal Organization and Administration"; and perhaps most specific, "Evaluation of the Program in Specific Fields".

Modern Hospital

Vol. 52, March 1939

*Sensible hiring. B. E. Beecher.—p. 81.
*Rejuvenating the kitchen. D. Steiner.—p. 100.
*Food for finicky patients. M. H. Riste and M. E. Herbert.—p. 104.

EMPLOYEES. There are 2 groups of unemployed people: the unemployable floaters who would not be dependable if employed; and the group honestly seeking employment and worthy of consideration. Taking time to study the qualifications of prospective employees before hiring saves the hospital time, money and trouble.

RE-EQUIPPED KITCHEN. The Wesley Hospital in Wichita, Kansas, has re-equipped its kitchen at a cost of $3421. This includes ranges, a fryer, bake ovens, food mixer, pastry table and a new tile floor.

TEMPTING FOOD. An illustrated article on attractive foods, covering garnishes for soups, fruits, relishes, salads, vegetables, and desserts. Dainty portions and high food standards are stressed for patient satisfaction.

The Nation's Schools

Vol. 23, March 1939

*Learning from the lunchroom. E. Smith.—p. 70.
*Where kitchen is classroom.—p. 74.

BETTER LUNCHROOMS. The manager is directly responsible for making the school lunchroom an educational unit in the school. Food habits and food standards of pupils can be improved by adroit salesmanship and sufficient time for eating luncheon. Social possibilities of the lunchroom should be stimulated. Supplying jobs to worthy pupils helps to broaden their technical education. School boards should build adequately equipped lunchrooms, hire trained and alert managers, and provide an adequate budget to make all this possible.

KITCHEN CLASSROOM. The floor plans of Thomas A. Edison Vocational School, Elizabeth, N. J., show kitchens designed for instructing pupils in food preparation and service as well as the use of school feeding.

Occupations

Vol. 17, March 1939

*Setting up an orientation course. I. T. Simley.—p. 524.
A successful high school and college cooperative program. K. Lawyer.—p. 533.
*A class in careers for women. A. B. Lorenz.—p. 535.
Motion pictures for teaching occupations—III.—p. 542.

ORIENTATION COURSE. An elective orientation course provided by South Saint Paul high school

prepares its students for jobs in the large packing and livestock industry in that city. The course, formulated with cooperation of local civic leaders, educators, and industrialists, was designed to improve mathematical accuracy, writing, and penmanship, to make students aware of scope and importance of the industry, and to make the adjustment from school to job less drastic.

CAREERS FOR WOMEN. Orientation course for freshmen at University of Toledo, designed to help student select suitable career, is set up in 8 or 9 unit groups with specialized study and research by students according to career interests. A "job clinic" held toward the end of the course emphasizes factors necessary to secure and hold a job.

Personnel Journal

Vol. 17, February 1939

*Financial reports for workers.—p. 280.
*Full use of employee ratings. H. L. Humke.—p. 292.
Vulnerable labor contract.—p. 304.

FINANCIAL REPORTS. The Employees' Relations Bureau of the National Retail Dry Goods Association, New York City, recommends that financial reports be made available to employees. This practice helps to bridge gap between employer and employee, explains working mechanism of organization to employee and brings home significance of job. Status of employee-employer relations must be kept in mind in making report, such as tone of everyday relations, status of collective bargaining, size of company and degree to which employees are already familiar with conduct of business, and educational background of employee. Suggested forms for presentation are included.

EMPLOYEE RATINGS. Collective bargaining for wage increases in different departments led to job classification plans. Arguments over pay rates then shifted to individual employees and whether they were worth their pay. This led to merit rating. The article points out how these ratings can be used by foremen to improve the abilities and attitudes of the workers.

Restaurant Management

Vol. 44, March 1939

*Department store tea rooms. N. Swett-Gray.—p. 12.
*Table layout to avoid "dead" spots. C. A. Castle.—p. 24.
Oil and shortening study.—p. 26.
*Dish sanitation practice.—p. 36.

TEA ROOM. An article describing the $60,000 modernization of the Crystal Tea Room, Bon Marche Department Store, Seattle. The extensive use of mirrors, glass brick panels, soft lighting, Venetian blinds and blended colors, made a fascinating atmosphere in the tea room. Modern equipment used in the "L" shaped kitchen and serving quarters and a sound proof passage to minimize noises from the kitchen, facilitated food production and improved service. The mid-day menu features daily changes set up in the center panel with variations every other day in the flanking columns. Fresh vegetables are cooked every half-hour and the planked vegetable plate is popular. Twenty-five waitresses are employed for the seating capacity of 253 and none but women cooks are employed. The floor plan shows unique seating arrangement.

TABLE LAYOUTS. This illustrated article explains how to eliminate dead spaces in the dining room. Shows that people prefer tables near walls or wall substitutes. Partitions, thick cords, elevated areas and curved balustrades help to make all tables equally desirable. Between 20–25 sq. ft. of floor space should be allowed per seat. Decorations and furniture in clear colors counterbalance somber clothes and tend to make a room cheerful.

DISHWASHING STANDARDS. The Hotel Statler's (Boston) dishwashing units are thoroughly ventilated, well-lighted and sound proof. A mechanic makes a daily inspection of all valves, cleanliness of tanks and sprays, mechanical conditions, temperature and cleanliness of rinse and lubrication of vital parts. A biweekly written report is made on the condition of the machines and recommendations suggested. Four times a year the chief engineer makes the inspection with the mechanic and a complete detailed report is sent to the manager's office. Standard directions for dishwashing are posted: wash

water, 140°F. with 6 oz. soap powder (and 6 oz. additional at peaks), and rinse water at scalding temperature. Glasses are rinsed at 190°F.

School Life

Vol. 24, March 1939

*Graduates of colleges and secondary schools. D. T. Blose.—p. 182.

STATISTICAL DATA. A statistical graph to accompany data gathered on a survey made of the estimated number of college graduates in 1938.

Science Leaflet

Vol. 12, February 1939

*Shelter and building materials. M. G. Heffner.—p. 30.
*Fruit kept fresh by modern method.—p. 39.

Vol. 12, March 1939

Copper—100 years of progress with copper.—p. 3.
The thermal properties of water. G. B. Welch.—p. 21.
*News items on light.—p. 15.
*Nutrition and health.—p. 30.

BUILDING MATERIALS AND HOUSING ACTS. Lists the materials used in modern constructions. The Wagner-Steagall Housing Bill will have a permanent result in improving living conditions, increasing standards of living, and employing millions of people for steady work. The United States Housing Authority will furnish money and advice for housing construction, but the community must take the initiative. Each state is limited to a housing fund of $50,000,000.

FRESH FRUIT. By substituting carbon dioxide gas for oxygen in fruit storage rooms, fruit keeps fresh almost twice as long. This discovery will save thousands of dollars for fruit growers, packers, and shippers.

LIGHT. Westinghouse and General Electric have announced a new type of electric lamp that uses ultraviolet light and fluorescent, chemically coated walls to produce white and colored light. The efficiency of the new bulbs is 100 times that of the old incandescent lamps; one type of lamp produces 60 lumens of light per watt in the 30-watt size, whereas the equivalent standard bulb produces 3/10th of a lumen per watt. Short-wave ultraviolet light kills germs in milk, combats molds and fungi, cures skin ailments and is being used in modern farm practice as well as in hospitals, bakeries, packing houses and restaurants. Dish sanitation is markedly improved by its use.

HUMAN NUTRITION. Summarizes the final report of the Mixed Committee of the League of Nations on "The Relation of Nutrition to Health, Agriculture and Economic Policy."

Better food at lower cost

Every woman who is concerned with the problem that food preparation presents is continually looking for new ways of combining inexpensive, readily available staples in wholesome, nourishing dishes which will have eye appeal and taste appeal.

Among the seventy tested recipes in the new Pet Milk cookbook "Better Food at Lower Cost for 2 or 4 or 6," you will find new and delicious flavor combinations—novel treatments for well-known foods—unusual versions of conventional dishes—skillful touches that transform old favorites into new creations. But of greatest value is the contribution which this unique collection of recipes makes in helping to put the much-needed quota of milk per person into the diet.

By using Irradiated Pet Milk, it is possible easily to include an extra amount of pure, safe, whole milk plus vitamin D in dishes that taste better because of the milk they contain. Because Pet Milk is double-rich, it can be diluted with less than an equal amount of another liquid—it can be used in place of cream—it will replace eggs and butter. And the result is better food at lower cost.

Irradiated Pet Milk, with its extra vitamin D, still costs less generally than ordinary milk—far less than cream.

PET MILK COMPANY, 1450e Arcade Building, St. Louis, Missouri

Please send me, free of charge, "Better Food at Lower Cost for 2 or 4 or 6."

I teach (subjects)_____ in _____ school (grade)

*Name*_____ *Address*_____

*City*_____ *State*_____

(Fill in completely. Offer limited to residents of Continental U. S. Not available in quantities.)

(In writing advertisers, please mention the journal.)

NEWS NOTES

American Dietetic Association, Special Pre-Convention Tour. A most economical and interesting travel itinerary as outlined below has been planned for members of the American Dietetic Association attending the Los Angeles meeting in August 1939. If a sufficient number sign up for the trip, special cars and possibly a special train will be available.

The tour will take in some of the most scenically beautiful country in the United States and Canada. It is expected that a special representative of the railroad company will be present, thus insuring that every comfort and convenience will be provided for those taking part.

The total cost for the tour, $175.00, includes railway fare from Chicago to San Francisco and Los Angeles and return to Chicago; Pullman, meals and other accommodations en route from Chicago to Los Angeles, as specified in the itinerary. The travel schedule follows:

Leave Chicago 12:35 p.m. central time, Friday, August 18, aboard C. & N. W. "The Mountaineer". Entire afternoon and evening traveling through Wisconsin.

Arrive St. Paul 9:15 p.m. central time, Friday, August 18. Minnesota and Iowa members may join party here.

Leave St. Paul 9:45 p.m. August 18.

Arrive Portal, N. D. 1:15 p.m. Saturday, August 19.

Leave Portal 12:50 p.m. mountain time, Saturday, August 19, crossing boundary line into Canada, over the Canadian Pacific Railroad, aboard "The Mountaineer". Balance of day traveling through wheat plains of Saskatchewan. Be sure to enjoy the lounge car, but plan to retire early Sunday night for the next day's activities.

Arrive Calgary 6:30 a.m. Sunday, August 20. Here the party will visit the observation tower of the Hotel Palliser from which the first glimpse of the giant Rocky Mountains may be obtained.

Leave Calgary 7:00 a.m. August 20. The train soon enters the "Gap" and from the open observation car the magnificent panorama of the Rockies can be viewed in all its splendor.

Arrive Banff Station 9:15 a.m. August 20. The party will detrain and board motor cars for Banff Springs Hotel. Balance of the morning to be spent at this marvelous "Castle in the Mountains", with luncheon served at hotel.

Leave Banff Springs Hotel 4:00 p.m. August 20. Motor over 42 miles of mountain roads with a stop-over of 45 minutes visiting Johnson Canyon.

Arrive Chateau Lake Louise 7:00 p.m. August 20. Watch the sunset on this glorious glacier. Dinner at the Chateau and room overnight. Early next morning, Monday, August 21, party will have breakfast at the Chateau followed by a choice of the following activities: an early morning hiking trip to Mirror Lake, Lake Agnes, "Lake in the Clouds"; motor trip to Moraine Lake, Valley of Ten Peaks; short walks; or a rest in the beautiful parlors overlooking Lake Louise.

Leave Chateau Lake Louise 10:30 a.m. August 21. Motor to station.

Leave Lake Louise Station 11:00 a.m. August 21, aboard "The Mountaineer". Afternoon spent enjoying the beauties of the Canadian Rockies, an ever changing picture, from the open observation car.

Arrive Vancouver 7:45 a.m. Tuesday, August 22. Luggage placed on conveyances and transported to steamer docks adjacent to station. An "early bird" sight-seeing trip can be arranged for exploring the city, especially the park system including Stanley Park.

Leave Vancouver 10:30 a.m. August 22, aboard the C.P.S.S. "Princess". Four delightful hours cruising across Puget Sound. Luncheon on board ship.

Arrive Victoria 2:40 p.m. August 22. Suggest taking sight-seeing trip around this beautiful city, "a little touch of Old England transplanted". Others may wish to visit the renowned Empress Hotel adjacent to docks.

Leave Victoria 5:00 p.m. August 22. Four more delightful hours of cruising across the sound. Gorgeous sunset, and dinner on board ship.

Salad days are here again!

BANANA BERRY SALAD is a cheery way to say "it's Spring." A colorful, delicately flavored salad with fresh berries, ripe bananas, and cool, crisp salad greens.

For best mellow flavor and easy digestibility, be sure to use fully ripe bananas . . . they are fully ripe when the yellow peel is generously flecked with brown.

Banana Berry Salad

(1 INDIVIDUAL SERVING)

1 ripe banana* Berries Salad greens

**Ripe banana . . . yellow peel flecked with brown*

Peel and cut banana lengthwise into halves. Place halves together on a plate. Slide one half off the other to form a step. Top this step with thin slices of strawberries or other fruit. Garnish with lettuce or other greens. Serve with a cream dressing or mayonnaise.

Banana Berry Salad is only one of the many new uses for bananas

Send for FREE Salad Recipes

Fruit Dispatch Company, Home Economics Dept.
Pier No. 3, North River, New York City

Please send me free, the Banana Salad Bazaar booklet containing recipes, salad dressings and useful salad hints.

Name_____

Address_____

City_____ State_____

United Fruit Bananas *distributed by* **Fruit Dispatch Co.**
JADA 539

Arrive Seattle 9:00 p.m. August 22. Taxi from docks to Benjamin Franklin Hotel for night—early breakfast next morning.

Leave Seattle 8:00 a.m. Wednesday, August 23, via motor to Mt. Rainier Park, 108 miles.

Arrive Paradise Inn 12:30 p.m. August 23, via motor. Luncheon.

Leave Paradise Inn 3:30 p.m. August 23, via motor.

Arrive Seattle 7:50 p.m. August 23, via motor. Dinner at Benjamin Franklin Hotel, evening with Seattle party.

Leave Seattle 11:30 p.m. August 23. Northern Pacific R. R.

Arrive Portland 6:30 a.m. Thursday, August 24. Northern Pacific. Entire day traveling through Oregon and Northern California. Early next morning traveling through Mt. Shasta country, on board Southern Pacific, "The Klamath".

Arrive San Francisco 7:50 a.m. Friday, August 25. Transfer to hotel—day and evening San Francisco Fair.

Leave San Francisco 8:15 a.m. Saturday, August 26. Southern Pacific, "The Daylight".

Arrive Los Angeles 6:00 p.m. Saturday, August 26.

Requests for further details regarding this trip should be addressed to the American Dietetic Association at 185 N. Wabash Avenue, Chicago. It should be emphasized that the rate does not include Pullman and incidental expenses returning from Los Angeles to Chicago.

Other Travel Arrangements to the Coast. For those who wish to travel even more economically to the Los Angeles meeting of the American Dietetic Association, tourist accommodations at a cost considerably less will be available. Those who do not plan to take the special tour as outlined above may take advantage of the "Grand Circle" tour offered by the Association of American Railroads which has established a flat rate of $90 coach fare, or $135 for intermediary or tourist class for a round trip which may take in the exposition in New York and that in San Francisco. Grand circle tickets are good for two months within a period beginning April 28 and ending October 28. They allow any number of stop-overs and any combination of routes, requiring nothing more than ticket validation at San Francisco and New York.

One may go on the "Nebraskan" which swings down through the Southwest, continue north following the Los Angeles meeting to Treasure Island on San Francisco Bay, proceed to the Atlantic seaboard via the northern route, and return over the midland rails, rolling up a total of 9000 miles for $90 without duplicating routes.

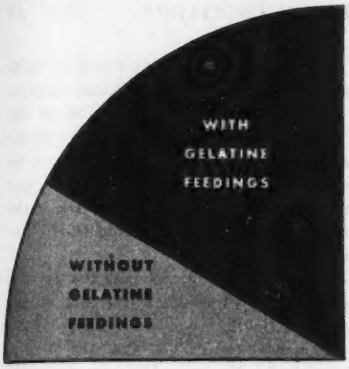
Motoring to California. Those who plan to motor to the Los Angeles meeting of the American Dietetic Association may be interested to know that the Travel Bureau of the *Woman's Home Companion* at 250 Park Avenue, New York City, will be glad to assist with information on such itineraries. The May issue of the *Woman's Home Companion* mentions fourteen motor itineraries, any one of which may be obtained for three cents upon application to the bureau. Leaflets on the national parks are also available. The bureau will be glad to give information about hotels and restaurants on any of the routes selected.

Katharine Brown of the California Dietetic Association writes that any who are planning to drive to California may write to the Automobile Club of Southern California, 2601 South Figueroa Street, Los Angeles, Calif., for information concerning the best routes. Miss Brown states that the Automobile Club has offered this service to members of the American Dietetic Association and it is suggested that members feel free to avail themselves of this source of information.

American Dietetic Association, Midyear Meeting of the Executive Board, Drake Hotel, Chicago, February 11–12, 1939. The meeting convened with the president, Anna M. Tracy, in the chair and the following present: Beula Becker Marble, Margaret Edwards, Angeline Phillips, Sarah Elkin Braun, Grace Bulman, Helen E. Walsh, Frances MacKinnon, Helen S. Mitchell, Mary P. Huddleson, Dorothy I. Lenfest, and Edith M. Barber.

Reports of all officers in attendance were presented and accepted.

A motion that the fifty-cent allowance per member not be granted in states which do not meet the constitutional requirements for affiliation was carried.



Light area represents a day's energy output by a test subject during the training period before gelatine feedings were started. Dark area represents a day's energy output by the same subject after gelatine feedings. In both cases the subject worked to the point of exhaustion.

Muscular Energy Doubled

By PLAIN KNOX GELATINE (U.S.P.)

Recent physiological research has confirmed the importance of the phosphocreatine phase in muscle contraction in a group of male subjects, and has shown that energy output can be increased by more than 100% through "concentrated" feedings of plain Knox Gelatine (U.S.P.).

"Proceedings of the Society for Experimental Biology and Medicine", 40:157, 1939.

Knox Gelatine is high in certain amino acids, which are precursors of muscular creatine. Thus, by increasing the phosphocreatine content of the muscle, Knox Gelatine increases its chemical store of potential energy.

The gelatine used in this study was plain Knox Gelatine (U.S.P.) which assays 85% protein and which should not be confused either with inferior grades of gelatine or with sugar-laden dessert powders, for these latter products will not achieve the desired effects. When you desire pure U.S.P. Gelatine, be sure to specify KNOX. Your hospital can get it on order.

EXTRA ENERGY FORMULA

Empty one envelope of Knox Gelatine in a glass three-quarters filled with cold water, fruit juice or milk. Let gelatine settle to the bottom of the glass, then stir briskly and drink immediately. Take four times a day for two weeks, then reduce to two envelopes a day. (May be taken before or after meals.)

Write Dept. 466

KNOX GELATINE LABORATORIES

JOHNSTOWN NEW YORK

Please send literature on the use of Knox Gelatine to increase energy.

Name_____

Street_____

City_____ State_____

(In writing advertisers, please mention the journal.)

It was moved and carried that the statement on the membership application form with regard to endorsers be reworded in such fashion that endorsers will realize it is necessary to know the applicant in a professional capacity after graduation in order to make a satisfactory endorsement.

It was moved and carried that applications of persons having less than 4 years of college work be received during the month of January in order to be given consideration by the Membership Committee.

It was moved and carried that since no official invitation had been received from the Canadian Dietetic Association for continued inspection of Canadian courses that no inspection of such courses be carried on this year.

It was recommended that a copy of Outline I incorporating changes and revisions as discussed at the midyear meeting be sent to a selected group of members in the educational field for criticism preparatory to discussing these requirements at the Los Angeles meeting.

It was moved and carried that the board express its appreciation to Ruth Wideburg for her many years of service in the business office of the association. Miss Wideburg resigned her position early this year after more than 12 years of service.

Following the report of Margaret Edwards, chairman of the committee appointed to study advertising policies, it was recommended that the following standards be met in considering JOURNAL advertising: (1) That the product conform to federal rules and regulations; (2) that the advertising be truthful and unexaggerated.

It was recommended that the association prepare literature for use in vocational guidance. Margaret Edwards was appointed to take the responsibility for compiling this material.

It was moved and carried that a person approved by the president be employed to edit the "Large Quantity Recipes" for publication this year.

The board voted to reappoint the Journal Editor for a term of 3 years, effective January, 1939.

The board voted to reappoint the Business Manager for a term of 1 year, effective March 1, 1939.

It was moved and carried that the recommendation of the House of Delegates to the effect that the chairman of the house be made a member of the Executive Board, that a minimum of 3 years as an active member of the A. D. A. be a qualification for a member of the House of Delegates, and that the secretary of the House of Delegates be elected for a two-year period on alternate years of the election of the chairman of the house, be referred to the Revisions Committee.

It was moved and carried that the Journal Editor be made an ex-officio member of the Investigation Board.

It was moved and carried that the Journal Editor and the Business Manager be made ex-officio members of the Journal and Executive Boards.

It was moved and carried that the association obtain further information regarding the status of the Army dietitian and the new bill concerning this matter now being prepared for the Senate.

It was moved and carried that the association become a cooperating member of the National Association of Better Business Bureaus.

It was moved and carried that the 1940 meeting be held at the Hotel Pennsylvania, New York City, during the week of October 20.

The Mellon Institute of Pittsburgh Reports a Short Cut to Tenderized Meat. Catherine J. Fry, Allegheny Hospital, Pittsburgh, represented this JOURNAL at a meeting of newspaper, magazine and science writers at a symposium luncheon at the Institute on March 21 when the announcement was made of a commercially practicable, short-cut to tender beef, approximately 19 times faster than nature's unaided process of tenderization by "ripening" or "hanging". Dr. M. D. Coulter, industrial fellow, believes that the new process raises all edible beef "approximately one grade in palatability" and affects all cuts from expensive prime grades down to chuck and hamburg steak. Perfection of the new process, involving air-conditioning and sterilization of beef, was made possible by a triple alliance of the scientific staffs of the Meat Merchandising Fellowship at Mellon Institute, the Kroger Food Foundation, and the Westinghouse Research Laboratories.

The institute disclosed that the controlled bactericidal radiations from a specially designed ultraviolet lamp invented by Westinghouse research engineers, now enable chemists to hasten the natural break-down of tough con-

Available Now

—

THE

NEW OUTLINES

OF COURSES

IN

NUTRITION

FOR NURSES

Price—Fifty Cents

The American Dietetic Association

185 N. Wabash Avenue

CHICAGO, ILLINOIS

The Only Gelatin Dessert Ready to Serve for

LOW-CARBOHYDRATE DIETS

READ WHY SUGAR-FREE D-ZERTA SAVES TIME AND TROUBLE!

D-Zerta's special formula (U. S. Pat. 1,522,428) brings you several advantages which you cannot get in other sugar and carbohydrate-free gelatins.

(1) Nothing to add but hot water—D-Zerta is ready to serve—everything's included. All you do is add hot water (it need not be boiling) and place in refrigerator to set.

(2) Rich Fruit Flavor—D-Zerta comes in the same flavors as Jell-O—America's Most Famous Dessert. With just enough saccharin and just enough fruit acid added to get that rich fruit flavor every patient enjoys. In appearance and aroma, too, D-Zerta is highly appetizing.

Six Delicious Flavors

You can increase variety in desserts and salads with D-Zerta's six delicious flavors—Strawberry, Raspberry, Cherry, Orange, Lemon and Lime. Not so much chance of monotony of diet with these six flavors to work with.

D-ZERTA'S Ingredients

(Average composition of one serving)

Carbohydrate	None
Fat	None
Protein (highest grade gelatin)	2.80 g.
Saccharin	0.04 g.
Fruit acid (calculated as citric)	1.45 g.
Pure fruit flavor (non-carbohydrate)	q. s.
U.S. certified food color (non-carbohydrate)	q. s.

D-ZERTA

THE SUGAR AND CARBOHYDRATE-FREE GELATIN DESSERT

Mail Coupon for FREE Sample

General Foods A.D.A.-5-39
Institution Dept.
Battle Creek, Michigan

Gentlemen:
Please send me a sample of D-Zerta's six assorted flavors. I understand there is no obligation.

Name.....

Position.....

Address.....

City.....*State*.....

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nective fibers in meat by applying relatively high temperatures and humidity in an atmosphere free of bacteria or mold spores. Uniform tenderization of beef is achieved by this method after only two or three days' exposure to a temperature of 60 degrees F. and this tenderizing period can be reduced to only a few hours if the temperature is increased to 85 degrees. This processing time contrasts with four to eight weeks which are required in the orthodox "hanging" process in meat coolers at temperatures from 33 to 38 degrees. The fundamental basis of the new process is the use of warmth to expedite the natural chemical reactions within beef, while the ultraviolet radiations from the "Sterilamps" prevent formation of mold or bacteria which naturally occurs on meat at elevated temperatures and controlled humidity prevents drying of meat surfaces with subsequent losses in trimming.

Having heard the discussions and sampled the steaks served, which were palatable, tender and juicy, and proof that the work was a success, Miss Fry believes that the new process will be of great value to dietitians. It is understood that the "Sterilamps" will be installed in refrigerators for institutional use with proper instructions for their use in the near future.

The Dietitian in State Institutions. The *Welfare Bulletin*, edited by A. L. Bowen, director, and published by the Illinois State Department of Public Welfare at Springfield, in its January–February issue reports the fall meeting of the Association of Illinois State Welfare Institutions. At this meeting Mrs. Christine Pensinger, state foods and textiles adviser, reported on the work of the dietary division for 1938. She called attention to many recent improvements in the dietary service, including the enforcement of physical examinations for all patients and employees working in the dietary departments of state institutions; the revision of all food specifications; greater attention to, and increased skill in canning surplus foods raised at the institutions; the emphasis on fly prevention campaigns; and the establishment of W.P.A. food projects in seven institutions.

The same issue reports regional conferences of the Division of Child Welfare on recreation and health programs. At a recent meeting Edna Mohr, nutritionist on the staff of the Elizabeth McCormick Fund, discussed "Adequate Diet for Growing Children". Agency representatives in attendance were supplied with a food guide which they were urged to follow in planning menus for children.

National Association of Better Business Bureaus. The American Dietetic Association has recently become one of 100 cooperating organizations devoted to a better understanding of business-consumer relations with regard to advertising and selling practices. Among the list of cooperating organizations are the following: The American Association of University Women, Buffalo Branch Inc.; American Home Economics Association; American Standards Association; Associated Grocery Manufacturers of America; Graduate School of Business, Stanford University; and Graduate Schools of Education and Business Administration, Harvard University.

The Bureau, whose address is 80 Summer St., Boston, announces a conference to be held in Buffalo, N. Y. June 5–6, at which leaders of the four interested groups, business, consumers, educators and government, are "to plan realistic programs of cooperation in regard to advertising and selling practices beneficial to both business and the consumer". Among the topics to be discussed are: "What Consumers Want", "What Educators are Doing", "What Government is Doing", and "What Business is Doing".

The Catholic Hospital Association of the United States and Canada announces that the twenty-fourth annual convention will be held at the Milwaukee Auditorium June 12–16, 1939, under the patronage and by the invitation of His Excellency, The Most Reverend Samuel A. Stritch, Archbishop of Milwaukee.

"Milligrams Per Cent" a Vague Term. The *Journal of the American Medical Association* for February 25, 1939 under its general news section calls attention to a vague phrasing too frequently used in scientific reports. Many authors use in their papers the terms "milligrams per cent" or "grams per cent" to express the results of laboratory investigations. These terms are vague and unreliable. The unit used should be specified, such as "milligrams per hundred cubic centimeters" or "milligrams per hundred grams."

ALICE IN BORDENLAND

"What are you looking for in the milk?" asked Alice.

"For something that isn't there," said the Man with the Long Eye.

Alice dared another question. "Pardon me, but isn't it a little silly to be looking for something that *isn't?*"

The man turned from looking through his microscope. "My dear," he said, "*no* precaution is silly when it helps safeguard foods on which the lives of little children depend. You see, I just *might* see something through this that could hurt children."

"But you said—"

"I know what I said," the man broke in. "That there really *was* nothing. And that's right. Borden cows are kept so healthy, and their milk is handled in such a sanitary way, that there is little chance of anything but *goodness* getting into it. But I'm an *extra* precaution to see that all the other precautions have done their work."

"Goodness!" said Alice. "That must make the milk very clean indeed."

"Not only the milk, but the many things Borden *makes* from milk—evaporated milk, and cheese, and Klim, and Beta Lactose."

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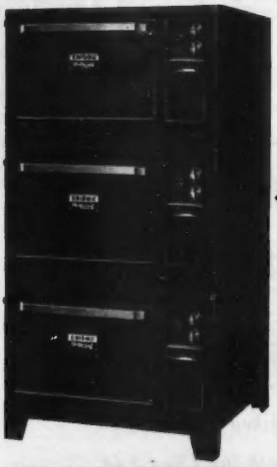

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Dr. Cyril N. H. Long, Yale University, delivered the Nathan Lewis Hatfield Lecture before the College of Physicians of Philadelphia February 1 on "Diabetes Mellitus in the Light of Our Present Knowledge of Metabolism."

American Chemical Society Award. Dr. Donald D. Van Slyke of the Rockefeller Institute of Medical Research is to receive the twenty-eighth Willard Gibbs Medal on May 19 in recognition of his work on the chemistry of the blood.

A Course in Commercial Dietetics. It was announced at a recent executive council meeting of the American Hotel Association that Tuskegee Institute has been endowed with a sum of $50,000 by the Carnegie Fund for the establishment of a course in commercial dietetics. The announcement followed a series of conferences with the president of the Institute, Dr. F. D. Patterson, directors of the Carnegie Fund, Mr. Lucius Boomer of The Waldorf-Astoria, Mr. Frank McKowne, head of the Hotels Statler Co. Inc., and President Green of the American Hotel Association. Tuskegee has long been known for its training of skilled men and women for positions in the culinary field.

Young Women's Christian Association, Providence, R. I. Eleanor Wells, director of the School of Homemaking, writes that a joint subcommittee of the Physical Education Department and Miss Wells' department are working on health and nutrition problems of the factory girl who "starts off with an inadequate breakfast, takes an inadequate lunch, and fills up on carbohydrates at night".

Miss Wells is also cooperating with the Rhode Island Hospital Out-Patient Department in work with junior members of the diabetic clinic. The boys and girls who attend the clinic have been meeting weekly for recreation and for a monthly program of education in which Dr. Raymond Luft, director, and Elsie Ewertz, clinic dietitian, and Miss Wells have taken part.

Under Miss Wells' direction the members of the School of Homemaking of the Y. W. C. A. have prepared graphic folders for distribution entitled "Do You Hit on All Cylinders?" "The Anti-Constipation Diet" and "Eat and Keep Fit, or Is Your House in Order?"

Postgraduate Institute. The fourth annual postgraduate institute of the Philadelphia County Medical Society, held March 13–17, had for a subject this year "Blood Dyscrasias and Metabolic Disorders". At a dinner of the county society on March 15, Dr. James F. McLester of Birmingham, Ala., delivered the J. Chalmers Da Costa Oration on "Borderline Nutritional States".

Dr. Thomas Parran, Jr., Surgeon General of the United States Public Health Service, speaking before the Drug, Chemical and Allied Trades Section of the New York Board of Trade at the Waldorf-Astoria, as reported by the New York *Herald Tribune* for March 10, 1939, urged the organization to make allotments of funds to encourage "fundamental studies in biology and chemistry in universities". Dr. Parran said further, "As examples of what might be possible now, I think our agricultural surpluses might present a different picture if we actually made it possible for each man, woman and child in this country to have everything he needed to eat. In the same way, I think it is a reasonable deduction that your own balance sheets would show increasing improvement, if we actually did what we know we can do to apply the principles of preventive medicine and to make available a minimum standard of good medical care for those diseases which can not be prevented."

Helen Stacey has been appointed nutrition consultant for the Henry Street Visiting Nurse Service, according to an announcement made by Katharine Faville, director of the Nursing Service. Miss Stacey served as nutritionist for the American Telephone and Telegraph Company for the past ten years and was responsible for the development of a nutrition program for the women employees of the Bell System. She has also served as nutritionist for the American Red Cross and the Association for Improving the Condition of the Poor of New York City. In addition to holding the degrees of B.S. from the School of Home Economics at Simmons College and M.A. from Teachers College, Columbia University, Miss Stacey has done special work at the New York School for Social Work.

University of Chicago. A course on "Internal Secretions" by Dr. Fred C. Koch, chairman of

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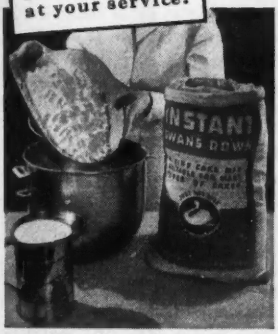

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the Department of Biochemistry, will be offered at the University of Chicago during the summer quarter according to plans recently announced. Dr. Koch's lecture course will be presented during the second term of the quarter, opening July 24. Another advanced course will be presented in the first term, opening June 21, by Dr. Martin E. Hanke, associate professor of biochemistry, on "The Application of Physical Chemistry to Biologic Problems". Laboratory work on this course will extend through the second term. Full research facilities also will be available during the summer quarter, and the curriculum likewise will present medical prerequisite courses in biochemistry.

New York Diabetes Association, Inc., held a clinical meeting under the auspices of the Committee on Surgery on April 28 at The New York Academy of Medicine. The program consisted of the following: "Treatment of Streptococcus Infections in Diabetes Mellitus with Sulfanilamide", Dr. John S. Lockwood, Department of Surgery, University of Pennsylvania; "Treatment of Anaerobic Infections in Diabetes Mellitus with Zinc Peroxide", Dr. Frank L. Meleney, Presbyterian Hospital, New York City; and "Diabetic Surgery", Dr. V. M. Murray Wright, visiting surgeon, Hospital of the University of Pennsylvania.

Institute of Euthenics, Vassar College. The Fourteenth Session, June 29–August 9, 1939, has been announced by Dr. Ruth Wheeler, the director. This year's program will be planned in terms of three conference groups. Students in each group will meet in daily seminar sessions with the faculty adviser and one or more resource specialists. Each student will register for one of the three conference groups, selecting the group which seems to fit his or her particular interests and needs most closely. The groups are as follows: (A) Development and Guidance of the Young Child (birth to twelve years); (B) Development and Guidance of the Adolescent and Young Adult; (C) Development and Guidance of the Adult (maturity through old age). The fees for six weeks are $150 for each child and $175 for each adult. Further information may be obtained from Dr. Ruth Wheeler, director, Institute of Euthenics, Vassar College, Poughkeepsie, New York.

International Stewards and Caterers Association, Inc., of New York. *Metropolitan News*, the monthly news sheet of this organization, mentions an interesting demonstration presented by Ina Lindman, director of home economics of the Fruit Dispatch Co., before 165 members of the association. Miss Lindman and her staff demonstrated many new uses of bananas.

Alabama Dietetic Association. The Dietetic Department of Howard College, of which Elizabeth Slater is head, entertained the members with a buffet supper on February 23 following a meeting of the association. After the supper the guests attended a Howard Dramatic Club presentation of "You Never Can Tell". Guests of honor, other than members of the association, were Dr. and Mrs. Raymond R. Paty, Dr. and Mrs. John Xan, Dr. Thomas V. Neal, Mrs. I. R. Obenchain, and Mr. Thomas Seay.

California Dietetic Association will hold a one-day meeting on May 29 at Yosemite National Park. The meeting is being held at this time of the year instead of the usual two-day convention in August in order not to conflict with the national meeting. The major portion of the time will be spent on the discussion of the 1939 American Dietetic Association meeting to be held in Los Angeles, August 27–31. Yosemite National Park is one of the most beautiful spots in California and members are looking forward to the meeting with great interest.

On Sunday, August 27, the members attending the 1939 meeting in Los Angeles will be entertained at a tea given by the California Home Economics Association, Southern Section. The hostesses are not divulging their plans but rumors indicate that the tea will be one of the gala events at the annual meeting.

Connecticut Dietetic Association. The spring meeting of the association was held at the Sterling Hall of Medicine, Yale University, New Haven, Connecticut, April 27, 1939.

Denver Dietitians have formed an organization for monthly meetings of professional and social interest. Ruby Kysar, head dietitian at St. Luke's Hospital, was chosen president of

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the group, and Mabelle V. Williams, assistant at Colorado General Hospital, secretary. Students of the Colorado General Hospital dietetic training course are accepted as associate members.

At the first meeting held on March 7, a round table discussion was led by M. Pauline Dill, head dietitian at Colorado General Hospital, and treasurer of the state organization. Problems considered included the instruction of patients on special diets, diet prescriptions, ward rounds and the teaching of patients, and adequacy of routine diets.

Maryland Dietetic Association. The student dietitians of the Johns Hopkins Hospital entertained the members of the association on March 13 with an original play, "A Day in the Food Clinic". The activities "Inside the Clinic", or "Everyman and His Stomach", were humorously portrayed in a series of four acts with an interesting prologue and epilogue. The varied experiences with their unpredictable results were thoroughly enjoyed by an audience greatly appreciative because of the realistic memories recalled. Following the play, refreshments in keeping with Saint Patrick's Day were served.

The annual state convention was held at the Belvedere Hotel, Baltimore, April 21–22.

The series of lectures on "Recent Advances of Nutrition" by J. Ernestine Becker, associate of Dr. E. V. McCollum of the Johns Hopkins School of Hygiene and Public Health, closed March 30. Her talks, covering "Minerals", "Acidosis and Alkalosis", "The Vitamins", and "Nutrition and Dental Caries" were presented in a very interesting manner and served as a review on what is new in nutrition. The lectures were attended by audiences of from 150 to 200 people—dietitians, home economics teachers, nurses, physicians, and students from various hospitals in the city.

The American College of Surgeons met at Baltimore March 15–17. Hospitals and dietary departments throughout the city were open to all interested visitors. E. M. Geraghty, chief dietitian of the Union Memorial Hospital, spoke to the group March 15 on "Diet Therapy as Especially Applicable to Surgical Diseases." Marian Connelly, chief dietitian of the University Hospital, assisted by Felisa Jenkins, participated in the forum on "Demonstrations in Hospital Administration," explaining the food service, main kitchen, diet laboratory, and central nourishment room of the University Hospital. Dr. Charles C. Higgens, member of the Cleveland Clinic staff, spoke on "Diet in Health and Disease" at the closing meeting at the Lyric Theater Friday evening.

The nominating committee, Mrs. Mary Diefenderfer Matlat, chairman, met March 17 to nominate officers for the year 1939–1940.

The Diet Therapy Section met February 27 to discuss the nutrition projects of the land grant colleges. The meeting was conducted by Felisa Jenkins, assistant dietitian of the University Hospital. She was assisted by the following student dietitians: Anne Hackett, Elinor Cruickshank, Helen Kaylor, and Frances Wilkins. At this meeting comparisons were also made of vitamin charts available for use at the present time.

Members of the association were invited to attend a lecture on the "Disorders of the Genito-urinary Tract" by Dr. John Tilden Howard of the Johns Hopkins Hospital, March 2.

The radio broadcasts, sponsored by the Community Education Section, continued each Thursday during March at 1.45 p.m. over Station WBAL. Violet Lake, nutritionist, Family Welfare Bureau, spoke on "Proteins", March 2; Anne Trentham, of the Extension Division of the University of Maryland, on "Minerals in the Diet", March 9; Helen Schmit, chief dietitian, Baltimore City Hospitals, on "Vitamins A and B", March 16; Kathleen Lewis, head dietitian of Johns Hopkins Hospital, "Vitamins C and D", March 23; Alice Jané, chief dietitian, Spring Grove State Hospital, Catonsville, Maryland, on "Vitamins E, F, and G", March 30. These broadcasts were concluded in April.

Massachusetts Dietetic Association. Sally Johnson, superintendent of nurses and principal of the School of Nursing, Massachusetts General Hospital, spoke on "Factors that Affect the Relationship Between the Dietetic and Nursing Departments of Hospitals" at the March meeting of the association. The association exhibited at the New England Hospital Association meeting at the Hotel Statler, Boston, on March 9–11. The show case of vitamin concentrates compiled by the Diet Therapy Committee, menus from several hospitals, and food charts

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prepared by students of the Massachusetts General Hospital, were on display. On March 3 the Beth Israel Hospital gave a tea for Adeline Wood. All who participated in teaching Beth Israel students were invited. Miss Wood spent five days in Boston inspecting student dietitian courses.

On March 24, Beula Becker Marble spoke to the Texas Dietetic Association on the subject "The Prognosis for the Dietetic Profession".

Helen S. Mitchell has been invited to give a graduate course in nutrition and a nutrition seminar during the last three weeks of summer school at Oregon State College in Corvallis. During the early part of August, she will take a vacation trip in the Northwest before attending the A. D. A. meeting in Los Angeles.

Gladys Cook, a member of the teaching staff at Massachusetts State College, will offer a summer course there in normal nutrition. The prerequisites and subject matter of this course make it suitable for those who wish to obtain a general survey of the subject.

Mary Robertson left the Massachusetts Memorial Hospitals in April to be married to Howard Buffington. Marjorie Shea has been appointed head dietitian in Miss Robertson's place. Betty Holmes from the Children's Hospital will be her assistant.

Dorothy Brigham has resigned her position at the Beth Israel Hospital to be married to Charles Steng.

Evelyn L. Nichols has resigned her position at the Peter Bent Brigham Hospital to become dietitian at the Burlington County Hospital, Mount Holly, New Jersey.

Adele Friedman, who has been at the New England Baptist Hospital, is to be an assistant dietitian at Beth Israel Hospital in place of Edith Taub, who has recently resigned. Beatrice Waxler is also to be an assistant at Beth Israel Hospital.

The Children's Hospital is having a reunion on June 8–10, to celebrate the 50th anniversary of the School of Nursing and the 70th anniversary of the hospital. No definite plans have been published, but the committees are working on arrangements.

Hortense Burleigh, dietitian at the Wheelock School, and Julia Dwight, Community Health Association nutrition worker, were among the speakers in a recent vocational guidance hour for freshmen at Simmons College. This program was one of a series in which alumnae have participated.

The Social Welfare and Public Health Section of the New England Home Economics Association met at the Forsyth Dental Infirmary on March 10. Dr. Reidar Sognnaes of Oslo gave a preliminary report of his observations in Tristan da Cunha, "the most isolated community in the world". Dr. Sognnaes was a member of the Norwegian Expedition to this island in 1937–38.

Memphis Dietetic Association. On March 1, and at the invitation of the Memphis Hospital Association, a program was presented under the direction of Fairfax Proudfit. A member of the dietetic staff from each hospital in the city took part in the program. Miss Proudfit discussed the duties of the dietitian, her place on the hospital staff and what the hospital may expect of her. The following took part: Miss Jolly of the John Gaston Hospital; Grace Gibson of the Marine Hospital and president of the Memphis Dietetic Association; Lydie Gauvin of the Veterans Administration Facility; Mary Mable Johnson of the Methodist Hospital; Jane Smith of the Willis C. Campbell Clinic; and Martha Greenman of the Baptist Hospital.

Mississippi Dietetic Association. The executive committee: Mabel Gladin of the North Mississippi Community Hospital, Tupelo; Dorothy McRae, Mississippi State Sanitorium; and Helen E. George, Veterans Administration Facility, Biloxi, met at luncheon in Jackson on March 24, for the purpose of planning the spring meeting of the association. The date was set for April 11 with headquarters at the Robert E. Lee Hotel, Jackson. Plans included a business meeting for the purpose of completing organization, a round table discussion of institution problems, a dinner and an evening meeting with a guest speaker of professional importance. It was hoped that all workers in the field of nutrition in the state of Mississippi, whether connected with hospitals, schools, dormitories, hotels, restaurants, teaching or home demonstration work, would accept the invitation of the association to attend this meeting. It was planned to invite representatives of companies supplying equipment and

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* "Nutrition Studies Following Tonsillectomies" – Stovin, J. S. Medical Record, 149:63, 1939.

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food products to attend the meeting and demonstrate their newest products.

Miss George, president of the association, writes that the idea of forming a state association was suggested when twelve members of the American Dietetic Association, residents of Mississippi, met over one of Mader's bountiful luncheon tables at the Milwaukee meeting in October 1938. Miss George states that the April meeting was for the purpose of adopting a constitution and electing permanent officers.

Greater New York Diabetic Association. A joint meeting was held with the Home Economics Association of the city at the Red Cross Building on March 14. Dr. Olga Knopf, assisting visiting physician, Bellevue Hospital, instructor in neurology, Cornell Medical School, and author of *The Art of Being a Woman* and *Women on Their Own*, spoke on "Women Among Themselves". On March 27 the Community Education Section, under the direction of Mabel Perry, chairman, New York Hospital, arranged a meeting at the Red Cross Building with Mrs. Rowena Schmidt Carpenter, assistant chief, Food and Nutrition Division, Bureau of Home Economics, speaking on "Activities of the Bureau".

The association met on April 10 at the auditorium of the Nurses' Residence, New York Hospital, with Dr. Paul Reznikoff of the New York Hospital speaking on "The Relation of the Dietitian to the Physician in Modern Medical Practice".

Doris Tisdale, chairman of the nominating committee, has presented the following report: for vice-president, Mary Ruth Curfman, St. Luke's Hospital, and Mabel Flanley, The Borden Company; for secretary, Margaret Anderson, Norwegian Hospital, and Helen B. Chapman, General Theological Seminary; and for members of the nominating committee, Margaret Brennan, John Adams High School, Patricia Edgerley, New York Medical Exchange, Harriet Wells Fahrney, Lenox Hill Hospital, Ina Lindman, United Fruit Company, Jessie McQueen, American Gas Association, Elizabeth Rupert, Hackensack Hospital, Edith Snook, French Hospital, and Rhoda Tyler, Grasslands Hospital.

North Carolina Dietetic Association. At the recent executive committee meeting it was decided that the annual meeting be held in Durham in connection with the Duke University Centennial. Very creditable progress reports were presented at the committee meeting by the section chairmen. It was voted that this spring a mimeographed news letter be sent to members which, it is hoped, will be the first issue of a regular bulletin.

Oklahoma Dietetic Association. The *Newsletter* of the association for April carried a program for the annual meeting held at the Mayo Hotel, Tulsa, April 21–22. Among the speakers were the following: Mayor Penny of Tulsa; Dr. Daisy I. Purdy, head of Household Science and Hotel Administration, Oklahoma Agricultural and Mechanical College, Stillwater; Dr. U. R. Loney of Tulsa; and Mr. W. I. Cleveland, chef of the Tulsa Club. Among the papers presented were the following: "Diet in Childhood", Dr. Helen Burton, head of Home Economics Department, University of Oklahoma, Norman; "Inspection of Fresh and Canned Fruits and Vegetables", Mr. W. B. Renfro, chief inspector, State Market Commission, Oklahoma Department of Agriculture; and "Food Purchasing", Adeline Wood, inspector of training courses, American Dietetic Association. The same issue carried a message of welcome to the annual meeting of the American Dietetic Association at Los Angeles by Octavie de Beaulieu, local Los Angeles chairman of publicity.

The association met on February 22 at St. Anthony's Hospital, Oklahoma City, with Dr. Coyne Campbell as speaker.

Philadelphia Dietetic Association participated in the Fourth Annual Post Graduate Institute of the Philadelphia County Medical Society March 13–17. On March 14 at the Children's Hospital, Philadelphia, with Dr. Joseph Stokes as leader, the topic "Nutrition Research at The Children's Hospital" was presented as follows: "Vitamin B and D Studies", Dr. Harold Stevens; "Soft Curd Milk", Dr. Irving J. Wolman; "Salt Metabolism", Dr. Mitchell I. Rubin; "Vitamin C Studies", Dr. Milton Rapoport; "Out-Patient Nutrition Studies", Dr. Theresa S. Rhoads; "Diet and Resistance to Infection", Claire Foster, research nutritionist; and "Chemical Analysis of Foodstuffs", Dorothy W. Asher, dietitian. Miss Foster, research nutri-

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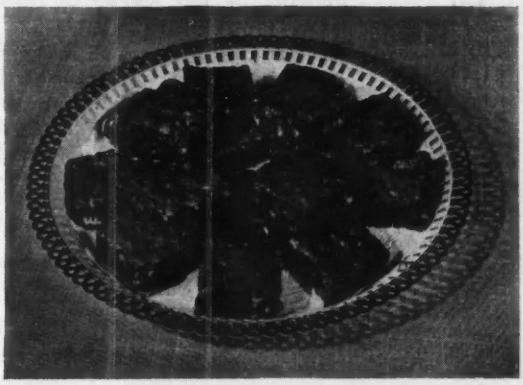

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tionist at the hospital, acted as hostess for the meeting.

On March 28 field trips were conducted to inspect the kitchens and equipment in new vocational schools. Jean C. Mueller, dietitian at Murrell Dobbins Vocational School and Frances M. Bunting, dietitian at the Edward W. Bok Vocational School, received the visitors at their respective institutions.

On April 15 the association met at Jefferson Medical College Hospital, with Dr. B. B. Vincent Lyon speaking on "New Dietary Trends in Gall Bladder Disease". Martha E. Walker, chief dietitian at the hospital, received the visitors.

The annual dinner was held on April 25 at the Penn Athletic Club, with Mrs. Mary P. Huddleson, editor of the JOURNAL, as guest speaker.

Virginia Dietetic Association. The pre-convention announcement of the Tri-State Hospital Conference (the Carolinas and Virginia) gave the date of the annual meeting as April 20–22 at the Roanoke Hotel, Roanoke, Virginia, with the Virginia Dietetic Association meeting in joint session. The tentative program carried the names of Dr. Malcolm T. MacEachern, president of the International Hospital Association and director of American College of Surgeons; Dr. G. Harvey Agnew, president, American Hospital Association; Dr. Joseph C. Doane, past president, American Hospital Association; and Anna M. Tracy, president, American Dietetic Association.

Miss Tracy was to extend greetings from the American Dietetic Association at the Tri-State President's Dinner on April 20. On the following day Miss Tracy was also to take part in a round table discussion at a joint session of the hospital and dietetic associations.

It was also announced that Grace Bulman, chief dietitian for the Veterans Administration at Washington, D. C. would participate in a panel discussion on personnel management on April 22.

Wisconsin Dietetic Association. According to *The Wisconsin Dietitian* for March 1939, the annual state meeting was held at the Hotel Schroeder, Milwaukee, March 24–25. The program covered the interests of the dietitian in her work as a teacher of the student nurse; her services to the family on a low income; to the children in school and the clinic; and her interests in the field of public health.

Theresa Goetz has resigned the office of president-elect for the coming year and Ethel Keating, who served as chairman of hospitality at the meeting of the American Dietetic Association in Milwaukee, has been appointed to the vacancy. Mrs. Keating is also editor of the attractive little publication, *The Wisconsin Dietitian*.

News from our Advertisers and Exhibitors. When "Dextri-Maltose" was marketed in 1911 "without dosage directions on the package," *Mead Johnson and Company* pioneered the principle that infant feeding was a therapeutic problem. Up to that time far more babies were fed by "grandmothers, neighbors, grocers, and commercial houses" than by physicians. This Mead policy was not readily accepted in the beginning, and it took many years of unceasing effort before the weight of the majority medical opinion finally led to mandatory action on the part of the Committee on Foods in 1932, whereby all makers of baby foods are now obliged to omit dosage directions. The Mead policy, however, does not stop here. It embraces other principles with which all physicians interested in the private practice of medicine are in agreement, such as: no descriptive circulars in packages, or in shipping cartons (for druggists to hand to patients); no display of Mead products for druggists' windows and counters; no advertising of Mead products to patients; no handbills or letters concerning Mead products are sent to patients; they do not broadcast to the public; they refer patients to physicians at every opportunity; and they devote a great deal of effort and resources to research and to activities that assist the private practice of medicine.

A publicity release from the *Knox Gelatine Laboratories* calls attention to the recent report in the *Proceedings of the Society for Experimental Biology and Medicine* concerning the effects of gelatine on muscular fatigue. Drs. G. B. Ray, J. R. Johnson, and M. M. Taylor of Long Island College of Medicine, fed gelatine to a group of men and women and found the six males able to increase by 37 to 240 per cent the amount of work produced before fatigue set in. Oddly enough, the four females failed to develop an

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appreciable increase in their energy output. Ray and co-workers first became interested in the subject because of previous reports citing delay in onset of muscular fatigue through addition of adequate amounts of glycine to a normal individual's diet. They sought a source of glycine which could be taken without the discomforts attending ingestion of large amounts of this amino acid in its isolated state. Dietary possibilities suggested the use of gelatine, which contains 25 per cent glycine. The ten subjects were trained on a specially designed bicycle ergometer. After a satisfactory training period had established their normal maximum work capacity, they were placed on a gelatine régime. The women received from 45 to 67.5 gm. daily; the men, 60 gm. mixed with chilled orange and lemon juice. In the men, the ergometer recorded high increases in the maximal output of work before fatigue set in. Shortly after discontinuance of the gelatine (orange and lemon juice continued) the total work output fell off. In the opinion of the investigators the good effects of the gelatine on work output seems to be related to its amino acids, especially glycine, which probably act to increase the creatine content of muscular tissue.

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WHO'S WHO IN THIS ISSUE

Walter Bradford Cannon, M.D., George Higginson professor of physiology at Harvard Medical School, received the A.B., A.M., M.D., and Sc.D. degrees from Harvard University, the Sc.D. degree from Yale University and the LL.D. from Wittenberg College and Boston University. He is Doctor, *honoris causa*, of the Universities of Liege, Strasbourg and Paris, and Baly medalist of the Royal College of Physicians, London. He was recently elected president of the American Association for Advancement of Science. As one of the most distinguished living physiologists, Dr. Cannon has been honored throughout the scientific world as Croonian lecturer by the Royal Society of London, as Harvard exchange professor to France, and elsewhere. Dr. Cannon is a member of the American Academy of Arts and Sciences, American Physiological Society, American Philosophical Society, Society of Experimental Biology and Medicine, Société de Biologie (Paris), Royal Society of Edinburgh and British Physiological Society. During the World War Dr. Cannon served as lieutenant-colonel in the Medical Corps, U. S. A., and received the decorations of Companion of the Bath (Brit.) and D.S.M. (U. S.). Among his writings best known to dietitians are *The Mechanical Factors of Digestion* and *Bodily Changes in Pain, Hunger, Fear and Rage.*

Arthur C. Bachmeyer, M.D., medical administrator, received the honorary D.Sc. degree from the University of Cincinnati in 1935. Dr. Bachmeyer has been engaged in the various phases of hospital administration since 1913. He was formerly professor of hospital administration and dean of the College of Medicine, University of Cincinnati, and since 1935 he has been professor and associate dean, Division of Biological Science, and director of clinics, University of Chicago. Dr. Bachmeyer is a past-president of the American Hospital Association and a member of the editorial staff of *Modern Hospital.*

J. Ernestine Becker received the B.S. degree from Cornell University, following which she completed the postgraduate course in hospital dietetics at Johns Hopkins Hospital. She then joined the staff of the Dietary Department of the same hospital, resigning later to take up her duties as assistant in the Biochemistry Department in the School of Hygiene and Public Health of the University. In 1928 she received the master's degree in biochemistry from the Johns Hopkins University. At present Miss Becker is associate in biochemistry under Dr. E. V. McCollum with whom she has collaborated in the preparation of *Food Nutrition and Health.* Since 1930 Miss Becker has taught the subjects of nutrition and diet in disease to nurses in the Johns Hopkins Hospital Nurses' Training School. Miss Becker also lectures on nutrition to the students in the School of Hygiene. She was a contributor to this JOURNAL for January 1935.

Sadie O. Morris received the B.S. degree from the Utah State Agricultural College and the Ph.D. degree from Columbia University. Dr. Morris was state nutrition specialist for the Utah Extension Service for four years previous to matriculating at Columbia. She is now associate professor of foods and nutrition at the Utah State Agricultural College, a position which she has held for the past four years. **Mildred Bowers** was a senior in the School of Home Economics, Utah State Agricultural College, at the time the study reported in this issue was made. She is now completing her work for the master's degree at Teachers College, Columbia University, under Dr. Mary de Garmo Bryan.

Arthur D. Holmes received the Ph.D. degree from Johns Hopkins University. He was formerly research chemist with the U. S. Department of Agriculture and since 1921 has been director of research for the E. L. Patch Company. Dr. Holmes is a member of the American Chemical Society, American Institute of Nutrition, Society of Biological Chemists, and has served on special vitamin committees for the U. S. Pharmacopeia and the Drug Manufacturers Association. **Francis Tripp** received the M.S. degree in chemistry from the University of North Carolina in 1937. Since 1930 he has been employed as a research biological chemist for the E. L. Patch Company, assisting Dr.

Holmes in research investigations. **Elmer A. Woelffer** is a doctor of veterinary medicine, having studied at the Agricultural College of the University of Wisconsin and the New York State Veterinary College at Cornell. He is a member of the board of directors of the Certified Milk Producers of America and is at present associated with H. P. Hood and Sons, Inc., as manager of Hood's Cherry Hill and Bonnie Brook Farms. **G. Howard Satterfield,** biochemist, has been assistant professor and more recently professor of biochemistry at North Carolina State College since 1924. He was a laboratory technician in the United States Army during the World War.

Olive Fay is a graduate of Mechanics Institute, Rochester, New York. From 1918 to 1923 she was manager of the East High School Lunchroom in Cleveland, Ohio, and later she was manager of the Senior High School Cafeteria in Atlantic City, New Jersey. Since 1934 she has been manager of the East High Lunchroom, Annex, School Number 31, Rochester, New York.

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